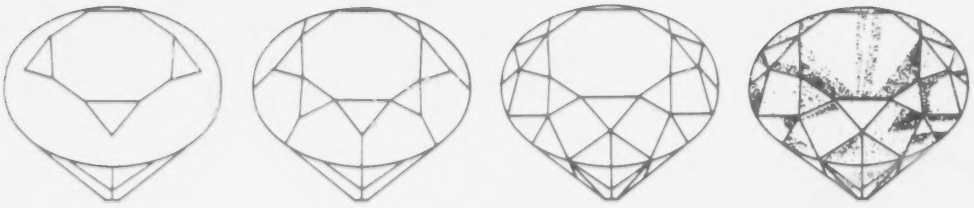
Geoscience Employment and Hiring Survey

1990



American Geological Institute

Geoscience Employment and Hiring Survey

1990

Prepared by

Nicholas H. Claudy, Director of Development,
and the AGI Human Resources Advisory Committee:

Marcus E. Milling, Chairman
Maria Luisa B. Crawford
O. James Gant
Travis H. Hughes
Kathleen M. Johnson
Donald A. Juckett
Donald W. Lewis
Norman L. McIver
Elisabeth G. Newton
Donald A. O'Nesky
Charles E. Tranter

American Geological Institute

Copyright © 1990 by American Geological Institute, 4220 King St., Alexandria, VA, 22302.
Printed and bound in the United States of America.
All rights reserved.

TABLE OF CONTENTS

List of Tables ix

List of Figures xiii

Introduction xv

I. Survey Description and Methodology 1

A. **Survey Description** 1

Table 1

B. **Survey Methodology** 2

1. **Derivation of Projections** 2

Table 2

2. **Terminology** 2

II. Survey Results - All Employer Categories 3

A. **Analysis of Current Employment Levels** 3

1. **Current Levels by Employer Category and Degree Level** 3

Tables 3, 4
Figure A

2. **Current Levels by Occupational Category and Degree Level** 4

Tables 5, 6
Figure B

B. **Analysis of 1989 Hiring Levels** 6

1. **1989 Hiring by Employer Category and Degree Level** 6

Tables 7, 8
Figure C

2. **1989 Hiring by Occupational Category and Degree Level** 7

Tables 9, 10
Figure D

C. **Projected Hiring Levels for All Employer Categories** 8

1. **1990 Hiring Levels by Occupational Category and Employer Category** 8

Table 11
Figure E

2. **1990 Hiring Levels by Employer Category and Degree Level** 9

Tables 12, 13
Figure F

3. **1990 Hiring Levels by Occupational Category and Degree Level** 11

Tables 14, 15
Figure G

D. **Comparison Between 1989 Actual Hiring Levels and Projected 1990 Hiring Levels** 12

1. **1989 Actual Hires/1990 Projected Hires - Comparison by Employer Category and Degree Level** 12

Table 16
Figure H

2. **1989 Actual Hires/1990 Projected Hires - Comparison by Occupational Category and Degree Level** . . 13

Table 17
Figure J

E. Summary of 1990 Hiring for Each Employer Category 14

III. Results for Each Employer Category 17

A. Domestic Oil and Gas Industry 17

1. Current Employment Levels 17

Table 18
Figure K

2. Number Hired in 1989 18

Table 19
Figure L

3. Projected Hiring for 1990 19

Tables 20, 21, 22
Figure M

4. Projected Losses for 1990 21

Table 23

5. Net Gain/Loss in Employment 21

Table 24
Figure N

6. Starting Salaries for Inexperienced New Hires 22

B. Domestic Mining and Minerals Industry 23

1. Current Employment Levels 23

Table 25
Figure O

2. Number Hired in 1989 24

Table 26
Figure P

3. Projected Hiring for 1990 25

Tables 27, 28, 29
Figure Q

4. Projected Losses for 1990 27

Table 30

5. Net Gain/Loss in Employment 27

Table 31
Figure R

6. Starting Salaries for Inexperienced New Hires 28

C. Federal and State Government Agencies 29

Federal Government Agencies 29

1. Current Employment Levels 29

Table 32
Figure S

2. Number Hired in 1989 30

Table 33
Figure T

3. Projected Hiring for 1990 31

Tables 34, 35, 36
Figure U

4. Projected Losses for 1990 33

Table 37

5. **Net Gain/Loss in Employment** 33
Table 38
Figure V
6. **Starting Salaries for Inexperienced New Hires** 34
State Government Agencies 35
1. **Current Employment Levels** 35
Table 39
Figure W
2. **Number Hired in 1989** 36
Table 40
Figure X
3. **Projected Hiring for 1990** 37
Tables 41, 42, 43
Figure Y
4. **Projected Losses for 1990** 39
Table 44
5. **Net Gain/Loss in Employment** 39
Table 45
Figure Z
6. **Starting Salaries for Inexperienced New Hires** 40
D. **Research Institutions and DOE-funded National Laboratories** 41
Research Institutions 41
1. **Current Employment Levels** 41
Table 46
Figure a
2. **Number Hired in 1989** 42
Table 47
Figure b
3. **Projected Hiring for 1990** 43
Tables 48, 49, 50
Figure c
4. **Projected Losses for 1990** 45
Table 51
5. **Net Gain/Loss in Employment** 45
Table 52
Figure d
6. **Starting Salaries for Inexperienced New Hires** 46
DOE-funded National Laboratories 47
1. **Current Employment Levels** 47
Table 53
Figure e
2. **Number Hired in 1989** 48
Table 54
Figure f
3. **Projected Hiring for 1990** 49
Tables 55, 56, 57
Figure g

4. **Projected Losses for 1990** 51
Table 58
5. **Net Gain/Loss in Employment** 51
Table 59
Figure h
6. **Starting Salaries for Inexperienced New Hires** 52
E. **Geoscientific Consulting Firms** 53
1. **Current Employment Levels** 53
Table 60
Figure j
2. **Number Hired in 1989** 54
Table 61
Figure k
3. **Projected Hiring for 1990** 55
Tables 62, 63, 64
Figure l
4. **Projected Losses for 1990** 57
Table 65
5. **Net Gain/Loss in Employment** 57
Table 66
Figure m
6. **Starting Salaries for Inexperienced New Hires** 58
F. **Academia** 59
1. **Current Employment Levels** 59
Table 67
Figure n
2. **Number Hired in 1989** 60
Table 68
Figure o
3. **Projected Hiring for 1990** 61
Tables 69, 70, 71
Figure p
4. **Projected Losses for 1990** 63
Table 72
5. **Net Gain/Loss in Employment** 63
Table 73
Figure q
6. **Starting Salaries for Inexperienced New Hires** 64
IV. Summary of Employment and Hiring Projections 65
A. **Current Employment Levels** 65
Table 74
B. **Projected Hiring** 66
Table 75
Figure r

V. Summary of Starting Salaries 67

Table 76
Figure s

APPENDIX: Current Employment Levels and Hiring Projections for 1990 69

I. Domestic Oil and Gas Industry 69

A. Current Employment Levels (Sample, as of 12/31/89) 69
B. Number Actually Hired in 1989 69
C. Sample Number of Inexperienced New Hires for 1990 70
D. Sample Number of Experienced Hires for 1990 70
E. Sample Number of Total Hires for 1990 71
F. Net Gain/Loss in Employment 71

II. Domestic Mining and Minerals Industry 72

A. Current Employment Levels (Sample, as of 12/31/89) 72
B. Number Actually Hired in 1989 72
C. Sample Number of Inexperienced New Hires for 1990 72
D. Sample Number of Experienced Hires for 1990 73
E. Sample Number of Total Hires for 1990 73
F. Net Gain/Loss in Employment 73

III. Federal and State Government Agencies 74

Federal Government Agencies 74

A. Current Employment Levels (Sample, as of 12/31/89) 74
B. Number Actually Hired in 1989 74
C. Sample Number of Inexperienced New Hires for 1990 74
D. Sample Number of Experienced Hires for 1990 75
E. Sample Number of Total Hires for 1990 75
F. Net Gain/Loss in Employment 75

State Government Agencies 76

G. Current Employment Levels (Sample, as of 12/31/89) 76
H. Number Actually Hired in 1989 76
I. Sample Number of Inexperienced New Hires for 1990 76
J. Sample Number of Experienced Hires for 1990 77
K. Sample Number of Total Hires for 1990 77
L. Net Gain/Loss in Employment 77

IV. Research Institutions and DOE-funded National Laboratories 78

Research Institutions 78

A. Current Employment Levels (Sample, as of 12/31/89) 78
B. Number Actually Hired in 1989 78
C. Sample Number of Inexperienced New Hires for 1990 79
D. Sample Number of Experienced Hires for 1990 79

E. Sample Number of Total Hires for 1990 79
F. Net Gain/Loss in Employment 80

DOE-funded National Laboratories 81

G. Current Employment Levels (Sample, as of 12/31/89) 81
H. Number Actually Hired in 1989 81
I. Sample Number of Inexperienced New Hires for 1990 81
J. Sample Number of Experienced Hires for 1990 82
K. Sample Number of Total Hires for 1990 82
L. Net Gain/Loss in Employment 82

V. Geoscientific Consulting Firms 83

A. Current Employment Levels (Sample, as of 12/31/89) 83
B. Number Actually Hired in 1989 83
C. Sample Number of Inexperienced New Hires for 1990 83
D. Sample Number of Experienced Hires for 1990 84
E. Sample Number of Total Hires for 1990 84
F. Net Gain/Loss in Employment 84

VI. Academia 85

A. Current Employment Levels (Sample, as of 12/31/89) 85
B. Number Actually Hired in 1989 85
C. Sample Number of Inexperienced New Hires for 1990 86
D. Sample Number of Experienced Hires for 1990 86
E. Sample Number of Total Hires for 1990 86
F. Net Gain/Loss in Employment 87

VII. Summary of Current Employment Levels and Hiring Projections for 1990 87

Tables

1. Summary of Responses to Questionnaire by Employer Category 1
2. Number and Percentage Reported of Total Employees 2
3. Current Employment Levels (as of 12/31/89) by Employer Category and Degree Level 3
4. Current Employment Levels by Employer Category and Degree Level 3
5. Current Employment Levels (as of 12/31/89) by Occupational Category and Degree Level 4
6. Current Employment Levels by Occupational Category and Degree Level 5
7. Number Actually Hired in 1989 by Employer Category and Degree Level 6
8. Number Actually Hired in 1989 by Employer Category and Degree Level 6
9. Number Actually Hired in 1989 by Occupational Category and Degree Level 7
10. Number Actually Hired in 1989 by Occupational Category and Degree Level 7
11. Summary of Projected Hiring Levels for 1990 by Occupational Category and Employer Category 8
12. Projected Hiring Levels for 1990 by Employer Category and Degree Level 9
13. Projected Hiring Levels for 1990 by Employer Category and Degree Level 10
14. Projected Hiring Levels for 1990 by Occupational Category and Degree Level 11
15. Projected Hiring Levels for 1990 by Occupational Category and Degree Level 11
16. Comparison by Degree Level of 1989 Actual Hires and 1990 Projected Hires for Each Employer Category 12
17. Comparison by Degree Level of 1989 Actual Hires and 1990 Projected Hires for Each Occupational Category 13
18. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Domestic Oil and Gas Industry 17
19. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Domestic Oil and Gas Industry 18
20. Projected New (Inexperienced) Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Domestic Oil and Gas Industry 19
21. Projected Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Domestic Oil and Gas Industry 19
22. Projected New (Inexperienced) and Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Domestic Oil and Gas Industry 20
23. Projected Losses for 1990 by Occupational Category and Degree Level for Domestic Oil and Gas Industry 21
24. Projected Net Gain/Loss in Employment for Domestic Oil and Gas Industry 21

25. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Domestic Mining and Minerals Industry . . . 23

26. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Domestic Mining and Minerals Industry . . . 24

27. Projected New (Inexperienced) Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Domestic Mining and Minerals Industry . . . 25

28. Projected Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Domestic Mining and Minerals Industry . . . 25

29. Projected New (Inexperienced) and Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Domestic Mining and Minerals Industry . . . 26

30. Projected Losses for 1990 by Occupational Category and Degree Level for Domestic Mining and Minerals Industry . . . 27

31. Projected Net Gain/Loss in Employment for Domestic Mining and Minerals Industry . . . 27

32. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Federal Government Agencies . . . 29

33. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Federal Government Agencies . . . 30

34. Projected New (Inexperienced) Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Federal Government Agencies . . . 31

35. Projected Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Federal Government Agencies . . . 31

36. Projected New (Inexperienced) and Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Federal Government Agencies . . . 32

37. Projected Losses for 1990 by Occupational Category and Degree Level for Federal Government Agencies . . . 33

38. Projected Net Gain/Loss in Employment for Federal Government Agencies . . . 33

39. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for State Government Agencies . . . 35

40. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for State Government Agencies . . . 36

41. Projected New (Inexperienced) Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for State Government Agencies . . . 37

42. Projected Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for State Government Agencies . . . 37

43. Projected New (Inexperienced) and Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for State Government Agencies . . . 38

44. Projected Losses for 1990 by Occupational Category and Degree Level for State Government Agencies . . . 39

45. Projected Net Gain/Loss in Employment for State Government Agencies . . . 39

46. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Research Institutions 41

47. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Research Institutions 42

48. Projected New (Inexperienced) Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Research Institutions 43

49. Projected Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Research Institutions 43

50. Projected New (Inexperienced) and Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Research Institutions 44

51. Projected Losses for 1990 by Occupational Category and Degree Level for Research Institutions 45

52. Projected Net Gain/Loss in Employment for Research Institutions 45

53. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for DOE-funded National Laboratories 47

54. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for DOE-funded National Laboratories 48

55. Projected New (Inexperienced) Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for DOE-funded National Laboratories 49

56. Projected Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for DOE-funded National Laboratories 49

57. Projected New (Inexperienced) and Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for DOE-funded National Laboratories 50

58. Projected Losses for 1990 by Occupational Category and Degree Level for DOE-funded National Laboratories 51

59. Projected Net Gain/Loss in Employment for DOE-funded National Laboratories 51

60. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Geoscientific Consulting Firms 53

61. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Geoscientific Consulting Firms 54

62. Projected New (Inexperienced) Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Geoscientific Consulting Firms 55

63. Projected Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Geoscientific Consulting Firms 55

64. Projected New (Inexperienced) and Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Geoscientific Consulting Firms 56

65. Projected Losses for 1990 by Occupational Category and Degree Level for Geoscientific Consulting Firms 57

66. Projected Net Gain/Loss in Employment for Geoscientific Consulting Firms 57

67. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Academia 59

68. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Academia 60

69. Projected New (Inexperienced) Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Academia 61

70. Projected Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Academia 61

71. Projected New (Inexperienced) and Experienced Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Academia 62

72. Projected Losses for 1989 by Occupational Category and Degree Level for Academia 63

73. Projected Net Gain/Loss in Employment for Academia 63

74. Summary of Current Employment Levels by Occupational Category and Employer Category 65

75. Summary of Projected Hiring Levels by Occupational Category and Employer Category 66

76. Approximate Starting Salaries for Inexperienced New Hires by Employer Category and Degree Level 67

Figures

A. Current Employment Levels by Employer Category and Degree Level 4

B. Current Employment Levels by Occupational Category and Degree Level 5

C. Number Actually Hired in 1989 by Employer Category and Degree Level 7

D. Number Actually Hired in 1989 by Occupational Category and Degree Level 8

E. Summary of Projected Hiring for 1990 by Occupational Category and Employer Category 9

F. Projected Hiring Levels for 1990 by Employer Category and Degree Level 10

G. Projected Hiring Levels for 1990 by Occupational Category and Degree Level 11

H. Comparison by Degree Level of 1989 Actual Hires and 1990 Projected Hires by Employer Category 12

J. Comparison by Degree Level of 1989 Actual Hires and 1990 Projected Hires by Occupational Category . . . 13

K. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Domestic Oil and Gas Industry 17

L. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Domestic Oil and Gas Industry 18

M. Projected Total Hires for 1989 by Occupational Objective, Occupational Category, and Degree Level for Domestic Oil and Gas Industry 20

N. Projected Net Gain/Loss in Employment by Occupational Category and Degree Level for Domestic Oil and Gas Industry 22

O. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Domestic Mining and Minerals Industry 23

P. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Domestic Mining and Minerals Industry 24

Q. Projected Total Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Domestic Mining and Minerals Industry 26

R. Projected Net Gain/Loss in Employment by Occupational Category and Degree Level for Domestic Mining and Minerals Industry 28

S. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Federal Government Agencies 29

T. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Federal Government Agencies 30

U. Projected Total Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Federal Government Agencies 32

V. Projected Net Gain/Loss in Employment by Occupational Category and Degree Level for Federal Government Agencies 34

W. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for State Government Agencies 35

X. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for State Government Agencies . . . 36

Y. Projected Total Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for State Government Agencies . . . 38

Z. Projected Net Gain/Loss in Employment by Occupational Category and Degree Level for State Government Agencies . . . 40

a. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Research Institutions . . . 41

b. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Research Institutions . . . 42

c. Projected Total Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Research Institutions . . . 44

d. Projected Net Gain/Loss in Employment by Occupational Category and Degree Level for Research Institutions . . . 46

e. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for DOE-funded National Laboratories . . . 47

f. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for DOE-funded National Laboratories . . . 48

g. Projected Total Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for DOE-funded National Laboratories . . . 50

h. Projected Net Gain/Loss in Employment by Occupational Category and Degree Level for DOE-funded National Laboratories . . . 52

j. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Geoscientific Consulting Firms . . . 53

k. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Geoscientific Consulting Firms . . . 54

l. Projected Total Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Geoscientific Consulting Firms . . . 56

m. Projected Net Gain/Loss in Employment by Occupational Category and Degree Level for Geoscientific Consulting Firms . . . 58

n. Current Employment Levels by Occupational Objective, Occupational Category, and Degree Level for Academia . . . 59

o. Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level for Academia . . . 60

p. Projected Total Hires for 1990 by Occupational Objective, Occupational Category, and Degree Level for Academia . . . 62

q. Projected Net Gain/Loss in Employment by Occupational Category and Degree Level for Academia . . . 64

r. Summary of Projected Hiring Levels by Occupational Category and Employer Category . . . 66

s. Approximate Starting Salaries for Inexperienced New Hires by Employer Category and Degree Level . . . 67

Introduction

The Geoscience Employment and Hiring Survey — 1990 is the third annual survey in AGI's ongoing program to examine and assess the need for and availability of geoscientists in a wide range of fields.

The hiring survey reports the results of a questionnaire sent in December 1989 to 310[1] companies, agencies, and universities representing the six major categories of geoscientific employers: domestic oil/gas industry, domestic mining/minerals industry, federal/state government agencies, research institutions/DOE-funded national laboratories, geoscientific consulting firms, and academia. There were 164 anonymous returns for an excellent response rate of 52.9%.

For each employer category, this report contains current employment levels (as of 12/31/89), followed by levels of actual hires in 1989. Following those figures are hiring levels for inexperienced and experienced hires. Losses — due to resignations, retirements and terminations — are presented, followed by approximate starting salaries for inexperienced hires by degree level. Summary tables at the end of the report and a detailed Appendix conclude the survey.

AGI gratefully acknowledges the participating employers, whose generous and detailed data are the basis of the survey, and the AGI Human Resources Advisory Committee, whose diligence has continued to guide this program successfully. AGI is also grateful to its Member Societies, whose constructive suggestions improved the final report.

AGI welcomes comments and suggestions on this program from all concerned geoscientists.

1 The actual number mailed was 323; however, 13 surveys were returned as undeliverable (3 for the mining/minerals category and 10 for geoscientific consulting firms).

GEOSCIENCE EMPLOYMENT AND HIRING SURVEY - 1990

I. Survey Description and Methodology

A. Survey Description

In December 1989, the American Geological Institute (AGI) sent out survey questionnaires to assess the current employment levels and anticipated 1990 hiring plans of six major categories of geoscientific employers:

- domestic oil and gas industry
- domestic mining and minerals industry
- federal and state government agencies
- research institutions and DOE-funded national laboratories
- geoscientific consulting firms
- academia

The questionnaires requested the following information:

- current employment levels (as of 12/31/89)
- the number actually hired in 1989, by degree level
- the number of inexperienced new hires anticipated to be hired in 1990, by degree level
- approximate starting salaries for new hires, by degree level
- the number of experienced geoscientists anticipated to be hired in 1990, by degree level
- the number of geoscientists expected to be lost in 1990 due to resignations, retirements and terminations.

All survey responses were returned anonymously.

Table 1 shows the response rate for each employer category:

TABLE 1

Summary of Responses to Questionnaire by Employer Category

Employer Category	Number Mailed	Number of Responses	Response Rate (%)
Domestic Oil and Gas Industry	34	15	44.1
Domestic Mining and Minerals Industry	30 (33)*	9	30.0
Federal/State Government Agencies	71	44	62.0
Research Institutions/ DOE-funded National Laboratories	30	9	30.0
Geoscientific Consulting Firms	45 (55)*	4	8.9
Academia	100	83	83.0
TOTAL	**310**	**164**	**52.9%**

* Three mining-/mineral-industry surveys and 10 consulting-firm surveys were returned as undeliverable.

B. Survey Methodology

1. Derivation of Projections

Responding employers provided the number of full-time current employees on their respective staffs. That number was compared to the estimated total number of employees in each employer category as described in AGI's *North American Survey of Geoscientists*. The number of employees reported in the hiring survey and the respective percentages that number represents are shown in Table 2:

TABLE 2

Number and Percentage of Total Employees

Employer Category	Number Reported Employed in Sample (12/31/89)	Total Number in Population	% of Employment Reported in Survey
Domestic Oil and Gas Industry	5,032	36,000	14.0
Domestic Mining and Minerals Industry	258	6,000	4.3
Federal and State Government Agencies	1,974	8,500	23.2
Research Institutions and DOE-funded National Laboratories	292	2,800	10.4
Geoscientific Consulting Firms	118	8,000	1.5
Academia	1,075	9,800	11.0
TOTAL	**8,749**	**71,100**	**12.3**

That percentage of employment reported was then applied to all actual figures that were provided by employers.

2. Terminology

Throughout this report, the term "projection" refers to AGI's projections for each survey question, as described above. Although employers also "projected" their 1990 employment and hiring levels, that type of projection is implied by the nature of the survey questions. The "actual" figures are here understood as all the raw data provided by the employers. Therefore, all "actual" (i.e., employer-provided) figures are the basis for all AGI "projections." Those "actual" data appear only in the Appendix.

The designation "geologists" includes geologists, geochemists, and other earth scientists. The designation "related professional scientists" describes those who use their non-geoscientific training or expertise for geoscientific applications, such as chemists in geochemistry laboratories and computer scientists processing geoscientific data bases.

In discussions of employment and hiring projections, two phrases are used to describe new hires:

- "inexperienced new hires" are any new hires who are hired/recruited directly from college/university campuses and who have had no previous full-time geoscientific or geoscientific-related employment/experience.
- "experienced new hires" are any new hires who have had previous full-time geoscientific employment or whose previous employment will be applied to geoscientific areas.

II. Survey Results - All Employer Categories

A. Analysis of Current Employment Levels

1. Current Levels by Employer Category and Degree Level

Employers provided their current employment levels (as of 12/31/89) according to degree level. Table 3 presents those results[1]:

TABLE 3

Current Employment Levels (as of 12/31/89)
By Employer Category and Degree Level

	Degree Level				
Employer Category	**BA/BS**	**MA/MS**	**PhD**	**Total**	**% of Total**
Domestic Oil and Gas Industry	10,976	19,959	5,013	35,948	50.6
Domestic Mining and Minerals Industry	3,092	2,465	441	5,998	8.4
Federal/State Government Agencies	3,661	2,876	1,943	8,480	11.9
Research Institutions/ DOE-funded National Laboratories	582	827	1,409	2,818	4.0
Geoscientific Consulting Firms	3,391	3,798	814	8,003	11.3
Academia	45	491	9,238	9,774	13.8
TOTAL	**21,747**	**30,416**	**18,858**	**71,021**	**100.0**

Table 4 and Figure A present these data as percentages by degree level for each employer category:

TABLE 4

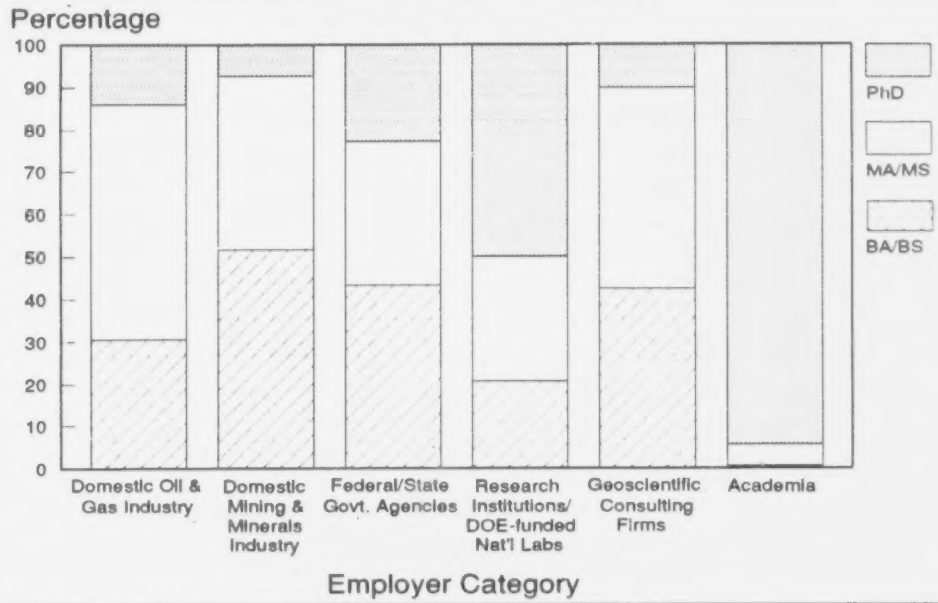
Current Employment Levels
by Employer Category and Degree Level
(as percentage for each employer category)

	Degree Level			
Employer Category	**% BA/BS**	**% MA/MS**	**% PhD**	**Total**
Domestic Oil and Gas Industry	30.5	55.5	14.0	100.0
Domestic Mining and Minerals Industry	51.6	41.1	7.4	100.1[2]
Federal/State Government Agencies	43.2	33.9	22.9	100.0
Research Institutions/ DOE-funded National Laboratories	20.6	29.4	50.0	100.0
Geoscientific Consulting Firms	42.4	47.5	10.2	100.1
Academia	0.5	5.0	94.5	100.0
TOTAL	**30.6**	**42.8**	**26.6**	**100.0**

1 All figures presented in the main text of this survey are the projections derived from the actual data received from the respondents. The "sample" (actual) figures are contained in the Appendix.

2 - Totals do not always sum to 100.0% due to rounding.

Figure A
Current Employment Levels
By Employer Category and Degree Level



2. Current Levels by Occupational Category and Degree Level

Current employment levels were also provided for occupational category and degree level, as shown in Table 5:

TABLE 5

Current Employment Levels (as of 12/31/89)
By Occupational Category and Degree Level

	Degree Level				
Occupational Category	**BA/BS**	**MA/MS**	**PhD**	**Total**	**% of Total**
Geologists	8,865	18,478	11,202	38,545	54.3
Geophysicists	3,858	6,033	3,795	13,686	19.3
Hydrologists/Hydrogeologists	568	1,819	975	3,362	4.7
Engineering Geologists	261	125	342	728	1.0
Related Professional Scientists	8,195	3,961	2,544	14,700	20.7
TOTAL	**21,747**	**30,416**	**18,858**	**71,021**	**100.0**

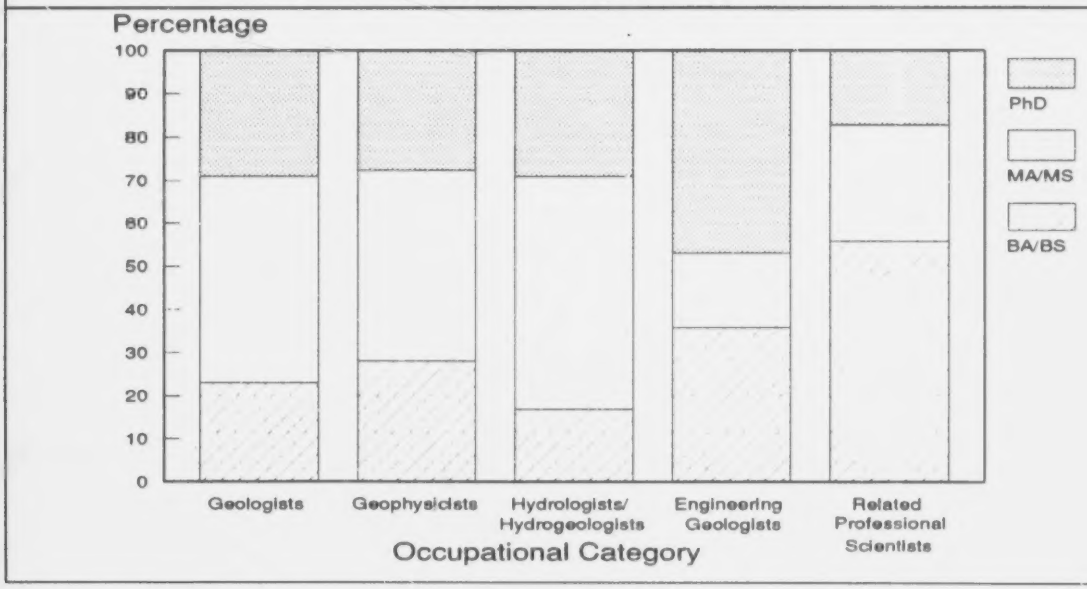
Table 6 and Figure B show these data as percentages by degree level for each occupational category:

TABLE 6

Current Employment Levels
by Occupational Category and Degree Level
(as percentage for each occupational category)

	Degree Level			
Occupational Category	**% BA/BS**	**% MA/MS**	**% PhD**	**Total**
Geologists	23.0	47.9	29.1	100.0
Geophysicists	28.2	44.1	27.7	100.0
Hydrologists/Hydrogeologists	16.9	54.1	29.0	100.0
Engineering Geologists	35.8	17.2	47.0	100.0
Related Professional Scientists	55.8	27.0	17.3	100.1
TOTAL	**30.6**	**42.8**	**26.6**	**100.0**

Figure B
Current Employment Levels
By Occupational Category and Degree Level



B. Analysis of 1989 Hiring Levels

1. 1989 Hiring by Employer Category and Degree Level

Survey respondents provided the numbers of actual hires in 1989, by degree level and by occupational category. Table 7 shows these data by employer category:

TABLE 7

Number Actually Hired in 1989 by Employer Category and Degree Level

	Degree Level				
Employer Category	**BA/BS**	**MA/MS**	**PhD**	**Total**	**% of Total**
Domestic Oil and Gas Industry	321	1,014	256	1,591	31.6
Domestic Mining and Minerals Industry	163	256	23	442	8.8
Federal/State Government Agencies	191	184	114	489	9.7
Research Institutions/ DOE-funded National Laboratories	31	24	170	225	4.5
Geoscientific Consulting Firms	543	678	136	1,357	27.0
Academia	54	99	772	925	18.4
TOTAL	**1,303**	**2,255**	**1,471**	**5,029**	**100.0**

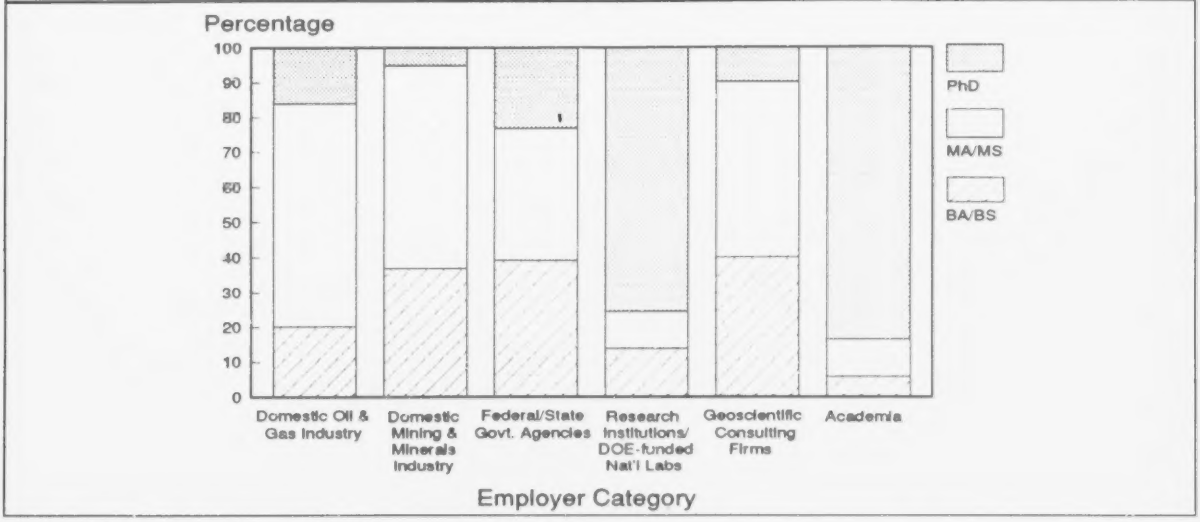
Table 8 and Figure C present these data as percentages by degree level for each employer category:

TABLE 8

Number Actually Hired in 1989 By Employer Category and Degree Level (as percentage for each employer category)

	Degree Level			
Employer Category	**% BA/BS**	**% MA/MS**	**% PhD**	**Total**
Domestic Oil and Gas Industry	20.2	63.7	16.1	100.0
Domestic Mining and Minerals Industry	36.9	57.9	5.2	100.0
Federal/State Government Agencies	39.1	37.6	23.3	100.0
Research Institutions/ DOE-funded National Laboratories	13.8	10.7	75.5	100.0
Geoscientific Consulting Firms	40.0	50.0	10.0	100.0
Academia	5.8	10.7	83.5	100.0
TOTAL	**25.9**	**44.8**	**29.3**	**100.0**

Figure C
Numbers Actually Hired in 1989
By Employer Category and Degree Level



2. 1989 Hiring by Occupational Category and Degree Level

Table 9 presents the number actually hired in 1989 by occupational category and degree level:

TABLE 9

Number Actually Hired in 1989
by Occupational Category and Degree Level

	Degree Level				
Occupational Category	**BA/BS**	**MA/MS**	**PhD**	**Total**	**% of Total**
Geologists	751	1,102	819	2,672	53.1
Geophysicists	248	494	256	998	19.8
Hydrologists/Hydrogeologists	19	578	242	839	16.7
Engineering Geologists	23	0	48	71	1.4
Related Professional Scientists	262	81	106	449	8.9
TOTAL	**1,303**	**2,255**	**1,471**	**5,029**	**99.9**

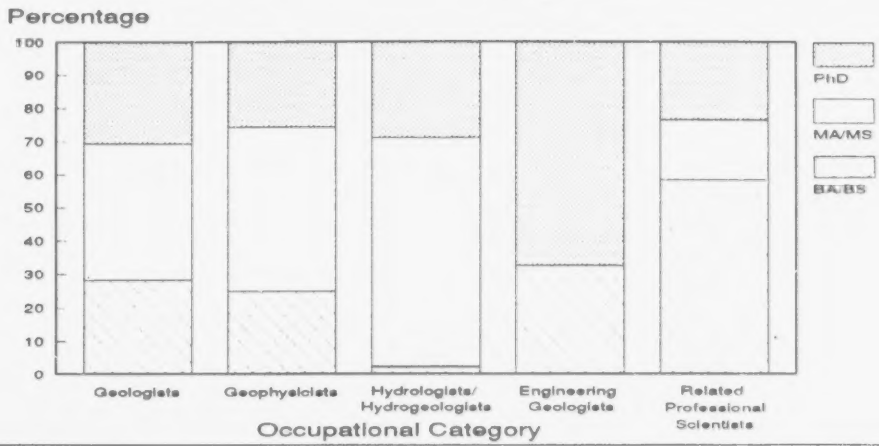
Table 10 and Figure D show these data as percentages by degree level for each occupational category:

TABLE 10

Number Actually Hired in 1989
by Occupational Category and Degree Level
(as percentage for each occupational category)

	Degree Level			
Occupational Category	**% BA/BS**	**% MA/MS**	**% PhD**	**Total**
Geologists	28.1	41.2	30.6	99.9
Geophysicists	24.8	49.5	25.6	99.9
Hydrologists/Hydrogeologists	2.3	68.9	28.8	100.0
Engineering Geologists	32.4	0.0	67.6	100.0
Related Professional Scientists	58.4	18.0	23.6	100.0
TOTAL	**25.9**	**44.8**	**29.3**	**100.0**

Figure D
Number Actually Hired in 1989
by Occupational Category and Degree Level



C. Projected Hiring Levels for All Employer Categories

1. 1990 Hiring Levels by Occupational Category and Employer Category

Table 11 and Figure E present a summary of projected hiring for 1990 by occupational category and geoscientific employer:

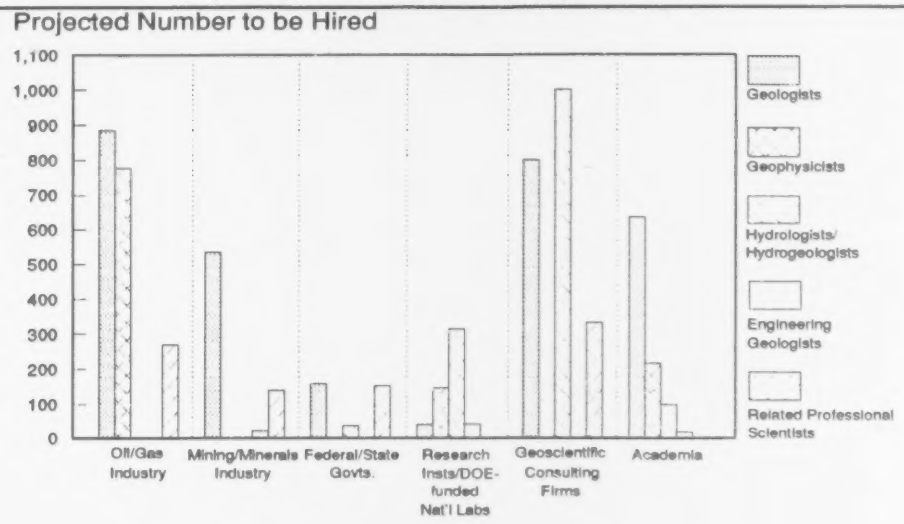
TABLE 11

Summary of Projected Hiring Levels for 1990
by Occupational Category and Employer Category

Occupational Category	Oil/Gas Industry	Mining/ Minerals Industry	Federal/ State Govts	Research Insts/ DOE-Funded National Labs	Geoscientific Consulting Firms	Academia	TOTAL	% of Total
	Employer Category							
Geologists	885	535	159	40	800	636	3,055	45.9
Geophysicists	777	0	2	147	0	217	1,143	17.3
Hydrologists/ Hydrogeologists	0	0	37	314	1,000	99	1,450	21.8
Engineering Geologists	0	23	0	42	0	18	83	1.5
Related Professional Scientists	270	140	153	3	333	0	899	13.5
TOTAL	(1,932)	(698)	(351)	(546)	(2,133)	(970)	(6,630)	(100.0)
	1,950[1]	**700**	**350**	**550**	**2,150**	**950**	**6,650**	
% Increase over Current Employment	**5.4**	**11.7**	**4.1**	**19.6**	**26.9**	**9.7**	**9.4**	
% of Total Hiring	**29.3**	**10.5**	**5.3**	**8.3**	**32.3**	**14.3**	**100.0**	

1 All totals are rounded to nearest 50.

Figure E
Summary of Projected Hiring Levels for 1990
By Occupational Category and Employer Category



2. 1990 Hiring Levels by Employer Category and Degree Level

Table 12 shows the projected hiring levels for 1990 by employer category and degree level:

TABLE 12

Projected Hiring Levels for 1990
by Employer Category and Degree Level

	Degree Level				
Employer Category	**BA/BS**	**MA/MS**	**PhD**	**Total**	**% of Total**
Domestic Oil and Gas Industry	335	1,213	384	1,932	29.1
Domestic Mining and Minerals Industry	256	372	70	698	10.5
Federal/State Government Agencies	139	179	33	351	5.3
Research Institutions/ DOE-funded National Laboratories	36	126	384	546	8.2
Geoscientific Consulting Firms	866	1,267	0	2,133	32.2
Academia	91	127	752	970	14.6
TOTAL	1,723	3,284	1,623	6,630	99.9
% of Total	26.0	49.5	24.5	100.0	

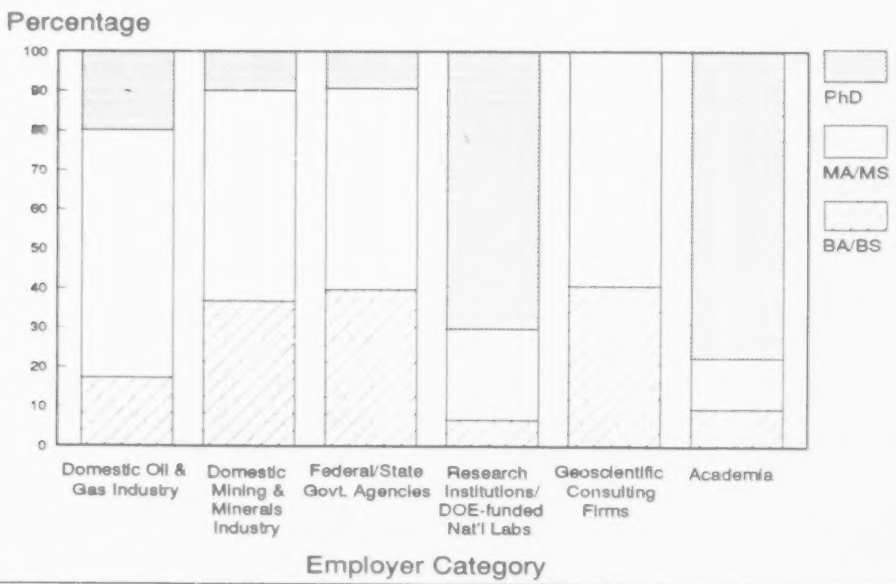
Table 13 and Figure F present these data as percentages of hires for each employer category:

TABLE 13

Projected Hiring Levels for 1990
by Employer Category and Degree Level
(as percentage for each employer category)

	Degree Level			
Employer Category	**% BA/BS**	**% MA/MS**	**% PhD**	**Total**
Domestic Oil and Gas Industry	17.3	62.8	19.9	100.0
Domestic Mining and Minerals Industry	36.7	53.3	10.0	100.0
Federal/State Government Agencies	39.6	51.0	9.4	100.0
Research Institutions/ DOE-funded National Laboratories	6.6	23.1	70.3	100.0
Geoscientific Consulting Firms	40.6	59.4	0.0	100.0
Academia	9.4	13.1	77.5	100.0
TOTAL	**26.0**	**49.5**	**24.5**	**100.0**

Figure F
Projected Hiring Levels for 1990
by Employer Category and Degree Level



3. 1990 Hiring Levels by Occupational Category and Degree Level

The projected hiring levels for 1990 by occupational category and degree level are shown in Table 14:

TABLE 14

Projected Hiring for 1990
by Occupational Category and Degree Level

	Degree Level				
Occupational Category	**BA/BS**	**MA/MS**	**PhD**	**Total**	**% of Total**
Geologists	659	1,570	826	3,055	46.1
Geophysicists	183	597	363	1,143	17.2
Hydrologists/Hydrogeologists	148	973	329	1,450	21.9
Engineering Geologists	0	32	51	83	1.2
Related Professional Scientists	733	112	54	899	13.6
TOTAL	1,723	3,284	1,623	6,630	100.0

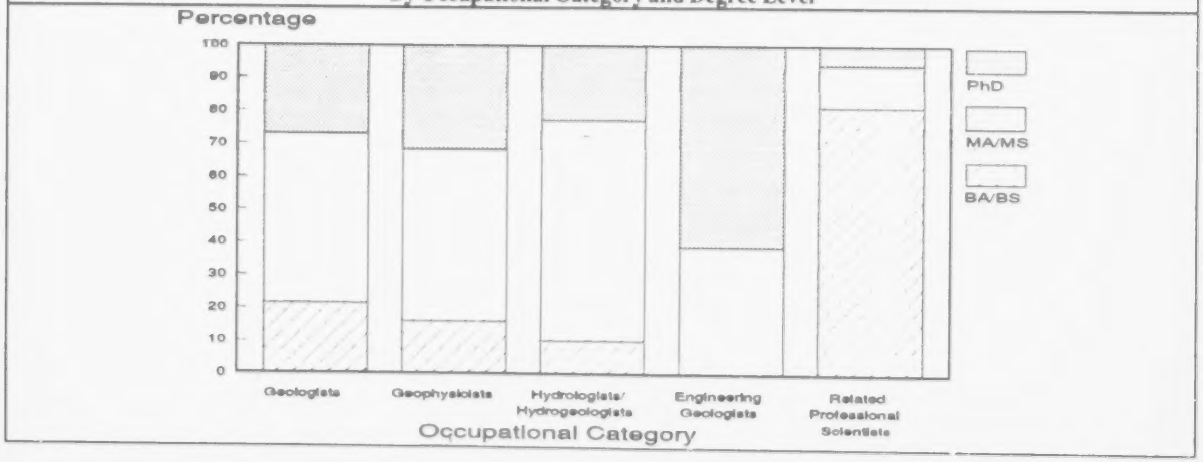
Table 15 and Figure G present these numbers as percentages of projected hiring by occupational category and degree level:

TABLE 15

Projected Hiring for 1990
by Occupational Category and Degree Level
(as percentage for each occupational category)

	Degree Level			
Occupational Category	**% BA/BS**	**% MA/MS**	**% PhD**	**Total**
Geologists	21.6	51.4	27.0	100.0
Geophysicists	16.0	52.2	31.8	100.0
Hydrologists/Hydrogeologists	10.2	67.1	22.7	100.0
Engineering Geologists	0.0	38.6	61.4	100.0
Related Professional Scientists	81.5	12.5	6.0	100.0
TOTAL	**26.0**	**49.5**	**24.5**	**100.0**

Figure G
Projected Hiring for 1990
By Occupational Category and Degree Level



D. Comparison Between 1989 Actual Hiring Levels and Projected 1990 Hiring Levels

1. Comparison by Employer Category and Degree Level

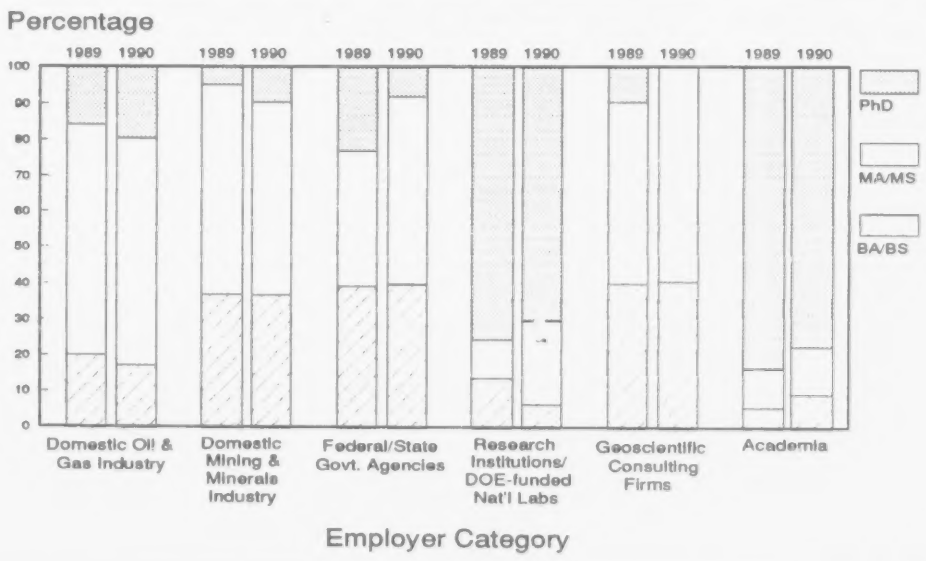
It is instructive to compare the percentages by degree level of 1989 actual hires and 1990 projected hires. That comparison is shown for each employer category in Table 16 and Figure H:

TABLE 16

Comparison by Degree Level of 1989 Actual Hires and 1990 Projected Hires for Each Employer Category (as percentage for each employer category)

	% BA/BS		% MA/MS		% PhD	
Employer Category	**1989**	**1990**	**1989**	**1990**	**1989**	**1990**
Domestic Oil and Gas Industry	20.2	17.3	63.7	62.8	16.1	19.9
Domestic Mining and Minerals Industry	36.9	36.7	57.9	53.3	5.2	10.0
Federal/State Government Agencies	39.1	39.6	37.6	52.0	23.3	9.3
Research Institutions/ DOE-funded National Laboratories	13.8	6.6	10.7	23.1	75.5	70.3
Geoscientific Consulting Firms	40.0	40.6	50.0	59.4	10.0	0.0
Academia	5.9	9.4	10.7	13.1	83.5	77.6

Figure H
Comparison by Degree Level of 1989 Hires and 1990 Projected Hires for Each Employer Category (as percentage for each employer category)



2. Comparison by Occupational Category and Degree Level

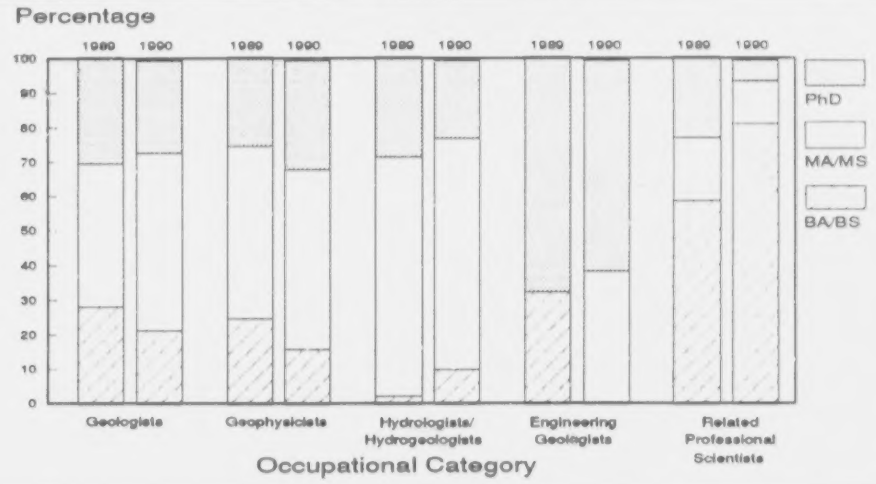
Table 17 and Figure J show a similar comparison between 1989 actual hires and 1990 projected hires by degree level for each occupational category:

TABLE 17

Comparison Between 1989 Actual Hires and 1990 Projected Hires by Degree Level for Each Occupational Category

	% BA/BS		% MA/MS		% PhD	
Occupational Category	**1989**	**1990**	**1989**	**1990**	**1989**	**1990**
Geologists	28.1	21.6	41.2	51.4	30.7	27.0
Geophysicists	24.8	16.0	49.5	52.2	25.6	31.8
Hydrologists/Hydrogeologists	2.3	10.2	68.9	67.1	28.8	22.7
Engineering Geologists	32.4	0.0	0.0	38.6	67.6	61.4
Related Professional Scientists	58.5	81.5	18.2	12.5	23.3	6.0

Figure J
Comparison Between 1989 Actual Hires and 1990 Projected Hires by Degree Level for Each Occupational Category



Based on the comparison by degree level between 1989 and 1990 hiring, there are several noteworthy trends.

- At the BA/BS level, research institutions/DOE-funded national laboratories will cut their hiring by half, while academic hiring will nearly double.
- At the MA/MS level, federal and state governments will increase their hiring, as will research institutions/DOE labs. Oil and gas industry and mining/minerals industry will show small decreases, while consulting firms and academia will increase hiring slightly.
- At the PhD level, federal and state governments will reduce significantly their PhD hiring, and consulting firms indicate no hiring at this level. Research institutions/DOE labs and academia will show small decreases. Oil and gas industry will increase slightly its PhD hiring. Mining/minerals will double its PhD-level hiring.

By occupational category, at the BA/BS level, engineering geologists will find very little employment. Less drastic reductions will occur for geologists and geophysicists. Both hydrologists and those classified as "related professional scientists" will find far greater employment opportunities.

At the MA/MS level, engineering geologists will find abundant employment opportunities, while geologists and geophysicists will find modestly improved conditions. Hydrologists and "related professional scientists" will see a slight slowdown in hiring.

At the PhD level, "related professional scientists" will see a significant decline in hiring opportunities. For geologists, hydrologists/-hydrogeologists, and engineering geologists, PhD-level hiring will decrease somewhat. Only geophysicists will find improved hiring prospects.

E. Summary of 1990 Hiring for Each Employer Category

1. Domestic Oil and Gas Industry

Of the 1,932 projected total hires for the domestic oil and gas industry, 71.3% will be inexperienced new hires and 28.7% will be experienced hires. Of the inexperienced new hires, 56.0% will have master's degrees, as will 79.6% of experienced new hired. For the overall total hires, 62.8% will have master's degrees.

By occupational category, 45.8% of the total new hires will be geologists, 40.2% will be geophysicists, and 14.0% will be related professional scientists. Of the new geologists, 71.9% will have master's degrees, as will 68.9% of the new geophysicists, and 15.6% of the new related professional scientists.

2. Domestic Mining and Minerals Industry

Of the 698 projected total hires for the domestic mining and minerals industry, 23.4% will be inexperienced and 76.6% will be experienced. Of the inexperienced new hires, 42.9% will have master's degrees, as will 56.4% of the experienced hires.

Of all new hires (inexperienced and experienced), 73.4% will be geologists, of whom 63.7% will have master's degrees.

3. Federal and State Government Agencies

a. Federal Government Agencies

Federal government agencies will hire 197 new geoscientists, of whom 44.7% will be inexperienced and 55.3% experienced. Of the inexperienced hires, 37.5% will have master's degrees, as will 49.5% of the experienced hires.

By occupational category, 31.0% of the total new hires will be geologists, 0.0% will be geophysicists, 3.6% will be hydrologists/-hydrogeologists, and 65.5% will be related professional scientists.

b. State Government Agencies

State government agencies will hire 154 new geoscientists, in the proportions of 50.6% inexperienced and 49.4% experienced. Of the inexperienced hires, 59.0% will have master's degrees, as will 60.5% of the experienced hires.

By occupational category, 63.6% of the total new hires will be geologists, 1.3% will be geophysicists, 19.5% will be hydrologists/-hydrogeologists, and 15.6% related professional scientists.

4. Research Institutions and DOE-funded National Laboratories

a. Research Institutions

Of the 64 total projected new hires in research institutions, 90.6% will be inexperienced of whom 62.1% will have a BA/BS and 37.9% will have a PhD. Of the total hires, none will be at the MA/MS level. Geologists will comprise 29.7% of the total hired, and 65.6% of new hires will be geophysicists.

b. DOE-funded National Laboratories

Of the 482 total projected new hires for national laboratories, 30.5% will be inexperienced and 69.5% will be experienced. Of the inexperienced hires, 42.9% will have master's degrees, as will 18.8% of the experienced hires. The survey indicates that there will be no hiring at the BA/BS level.

By occupational category, 4.4% of the total new hires will be geologists, 21.8% will be geophysicists, 65.2% will be hydrologists/hydrogeologists, and 8.7% will be engineering geologists.

5. Geoscientific Consulting Firms

Of the 2,133 projected total hires for geoscientific consulting firms, 28.1% will be inexperienced and 71.9% will be experienced. Of the inexperienced hires, 55.6% will have master's degrees, as will 60.9% of the experienced hires. There is no projected hiring at the PhD level.

By occupational category, 37.5% of the total new hires will be geologists, 46.9% will be hydrologists/hydrogeologists, and 15.6% will be other related scientists.

6. Academia

Of the 970 projected total hires for academia, there will be nearly equal numbers of inexperienced (50.5%) and experienced (49.5%) persons. Of the inexperienced new hires, 90.8% will have doctoral degrees, as will 64.0% of the experienced new hires.

By occupational category, 65.6% of the total new hires will be geologists, 22.3% will be geophysicists, 10.3% will be hydrologists/hydrogeologists, and 1.8% will be engineering geologists.

III. RESULTS FOR EACH EMPLOYER CATEGORY

A. Domestic Oil and Gas Industry

Appendix, Tables I.A-F

1. Current Employment Levels

Respondents in this employer category indicated their company size in terms of the number of geoscientific personnel employed. Of the 15 companies responding, 6 had less than 100 geoscientific employees, 2 companies had between 200 and 300, and 7 had more than 300. The range of surveyed companies responding, in other words, seemed representative of the industry.

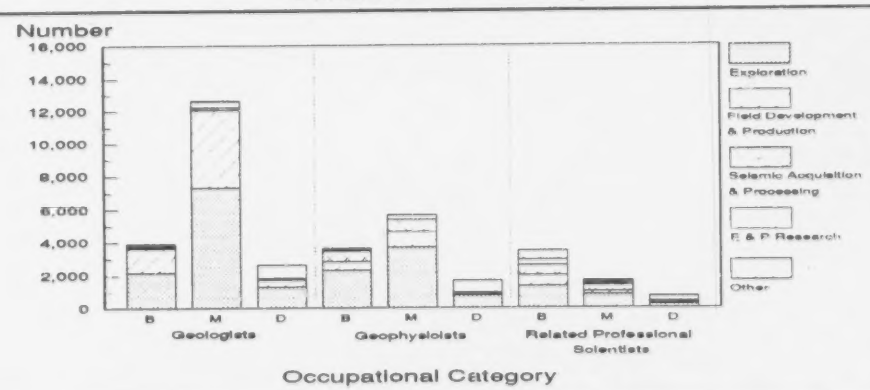
Table 18 and Figure K show the projected current employment levels (as of 12/31/89) by occupational objective, occupational category, and degree level:

TABLE 18

Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Domestic Oil and Gas Industry

	Occupational Category													
	Geologists[1]			Geophysicists			Related Professional Scientists[2]			TOTAL				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	TOTAL	% OF TOTAL
Exploration	2,171	7,314	1,307	2,300	3,686	771	1,321	800	243	5,792	11,800	2,321	19,913	55.4
Field Development & Production	1,464	4,757	421	514	936	43	671	186	100	2,649	5,879	564	9,092	25.3
Seismic Acquisition & Processing	107	157	86	679	736	107	607	400	57	1,393	1,293	250	2,936	8.2
E & P Research	107	386	793	114	286	743	300	136	307	521	808	1,843	3,172	8.8
Other	50	21	14	7	29	7	564	129	7	621	179	28	828	2.3
Total	**3,899**	**12,635**	**2,621**	**3,614**	**5,673**	**1,671**	**3,463**	**1,651**	**714**	**10,976**	**19,959**	**5,006**	**35,941**	**100.0**
			19,155			**10,958**			**5,828**			**35,941**		

Figure K
Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Domestic Oil and Gas Industry



1 Includes Geochemists

2 e.g., Computer Scientists processing geoscience data, chemists in geochemistry labs, etc.

2. Number Hired in 1989

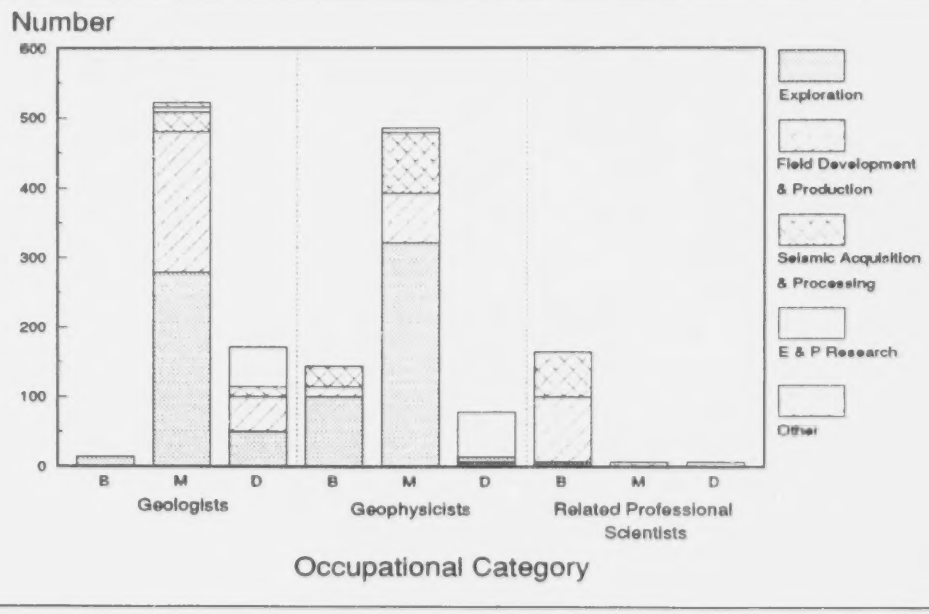
Employers provided the number of geoscientists actually hired in 1989, as shown in Table 19 and Figure L:

TABLE 19

Number of Geoscientists Actually Hired in 1989
By Occupational Objective, Occupational Category, and Degree Level
Domestic Oil and Gas Industry

	Occupational Category													
	Geologists			Geophysicists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**TOTAL**	**% OF TOTAL**
Exploration	14	279	50	100	321	7	7	0	0	121	600	57	778	48.9
Field Development & Production	0	200	50	14	71	0	93	0	0	107	271	50	428	26.9
Seismic Acquisition & Processing	0	29	14	29	86	7	64	7	0	93	122	21	236	14.8
E & P Research	0	7	57	0	7	64	0	0	7	0	14	128	142	8.9
Other	0	7	0	0	0	0	0	0	0	0	7	0	7	0.4
Total	**14**	**522**	**171**	**143**	**485**	**78**	**164**	**7**	**7**	**321**	**1,014**	**256**	**1,591**	**99.9**
			707			**706**			**178**			**1,591**		

Figure L
Number of Geoscientists Actually Hired in 1989
by Occupational Objective, Occupational Category, and Degree Level
Domestic Oil and Gas Industry



3. Projected Hiring for 1990

Employers provided the number of expected hires for 1990. Those estimates project the number of new hires (i.e., those to be hired directly from colleges/universities) and experienced hires. Table 20 shows projections for new hires by occupational objective, occupational category, and degree level:

TABLE 20

Projected New (Inexperienced) Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Domestic Oil and Gas Industry

	Occupational Category													
	Geologists			Geophysicists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	TOTAL	% OF TOTAL
Exploration	0	229	93	50	221	14	0	0	0	50	450	107	607	44.1
Field Development & Production	0	179	21	7	29	7	86	14	14	93	222	42	357	25.9
Seismic Acquisition & Processing	0	21	14	21	57	36	50	14	0	71	92	50	213	15.5
E & P Research	0	0	100	0	7	36	0	0	7	0	7	143	150	10.9
Other	0	0	0	0	0	0	50	0	0	50	0	0	50	3.6
Total	**0**	**429**	**228**	**78**	**314**	**93**	**186**	**28**	**21**	**264**	**771**	**342**	**1,377**	**100.0**
			657			**485**			**235**			**1,377**		

Table 21 shows projected 1990 hiring for experienced geoscientists:

TABLE 21

Projected Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Domestic Oil and Gas Industry

	Occupational Category													
	Geologists			Geophysicists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	TOTAL	% OF TOTAL
Exploration	7	121	0	43	136	0	0	0	7	50	257	7	314	56.6
Field Development & Production	0	43	0	7	21	0	7	7	0	14	71	0	85	15.3
Seismic Acquisition & Processing	0	36	0	0	57	0	0	7	0	0	100	0	100	18.0
E & P Research	0	0	14	0	7	21	0	0	0	0	7	35	42	7.6
Other	0	7	0	0	0	0	7	0	0	7	7	0	14	2.5
Total	**7**	**207**	**14**	**50**	**221**	**21**	**14**	**14**	**7**	**71**	**442**	**42**	**555**	**100.0**
			228			**292**			**35**			**555**		

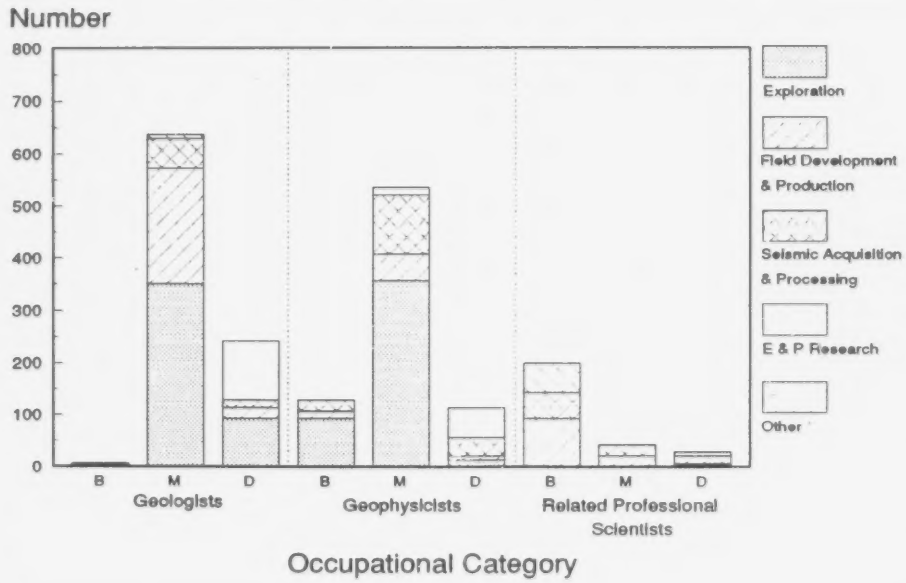
Table 22 and Figure M present the total projected hiring (inexperienced and experienced) for 1990 for the domestic oil and gas industry:

TABLE 22

Projected New (Inexperienced) and Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Domestic Oil and Gas Industry

	Occupational Category													
	Geologists			Geophysicists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**TOTAL**	**% OF TOTAL**
Exploration	7	350	93	93	357	14	0	0	7	100	707	114	921	47.7
Field Development & Production	0	222	21	14	50	7	93	21	14	107	293	42	442	22.9
Seismic Acquisition & Processing	0	57	14	21	114	36	50	21	0	71	192	50	313	16.2
E & P Research	0	0	114	0	14	57	0	0	7	0	14	178	192	9.9
Other	0	7	0	0	0	0	57	0	0	57	7	0	64	3.3
Total	**7**	**636**	**242**	**128**	**535**	**114**	**200**	**42**	**28**	**335**	**1,213**	**384**	**1,932**	**100.0**
			885			**777**			**270**			**1,932**		

Figure M
Projected Total Hires for 1990
by Occupational Objective, Occupational Category, and Degree Level
Domestic Oil and Gas Industry



4. Projected Losses for 1990

Table 23 presents the number expected to be lost in 1990, due to resignations, retirements, and terminations:

TABLE 23

Projected Losses for 1990
By Occupational Category and Degree Level
Domestic Oil and Gas Industry

	Occupational Category													
	Geologists			Geophysicists			Related Professional Scientists			TOTALS				
Reason for Loss	B	M	D	B	M	D	B	M	D	B	M	D	TOTAL	% OF TOTAL
Resignations	43	321	29	29	243	7	93	50	0	165	614	36	815	57.6
Retirements	121	86	36	29	121	7	7	0	0	157	207	43	407	28.8
Terminations	29	64	14	14	43	0	29	0	0	72	107	14	193	13.6
Total	**193**	**471**	**79**	**72**	**407**	**14**	**129**	**50**	**0**	**394**	**928**	**93**	**1,415**	**100.0**
			743			**493**			**179**			**1,415**		

5. Net Gain/Loss in Employment

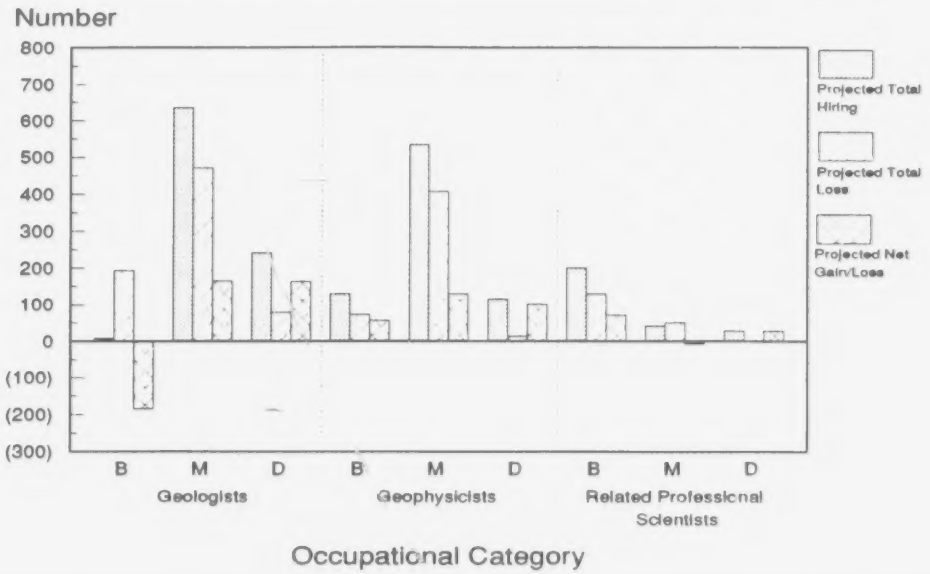
The difference between the projected total hiring and the projected total employment loss provides the net gain. Table 24 and Figure N present the net gain/loss for the domestic oil and gas industry:

TABLE 24

Projected Net Gain/Loss in Employment
Domestic Oil and Gas Industry

	Occupational Category												
	Geologists			Geophysicists			Related Professional Scientists			TOTALS			
	B	M	D	B	M	D	B	M	D	B	M	D	TOTAL
Projected Total Hiring	7	636	242	128	535	114	200	42	28	335	1,213	384	1,932
Projected Total Loss	193	471	79	72	407	14	129	50	0	394	928	93	1,415
Projected Net Gain/Loss	**-186**	**165**	**163**	**56**	**128**	**100**	**71**	**-8**	**28**	**-59**	**285**	**291**	**517**
			142			**284**			**91**			**517**	

Figure N
Projected Net Gain/Loss in Employment
by Occupational Category and Degree Level
Domestic Oil and Gas Industry



6. Approximate Starting Salaries for Inexperienced New Hires

The approximate starting salaries for inexperienced new hires by degree level are as follows:

Degree Level	Approximate Starting Salary
BA/BS	$ 32,500
MA/MS	$ 37,250
PhD	$ 43,750

B. Domestic Mining and Minerals Industry

Appendix, Tables II.A-F

1. Current Employment Levels

Respondents in this employer category indicated if they were independent minerals producers or integrated minerals/energy resource companies. Of the 10 companies responding, 6 were independent minerals producers and 4 were integrated minerals/energy resource companies. The data presented in this section represent the combined results for both types of companies.

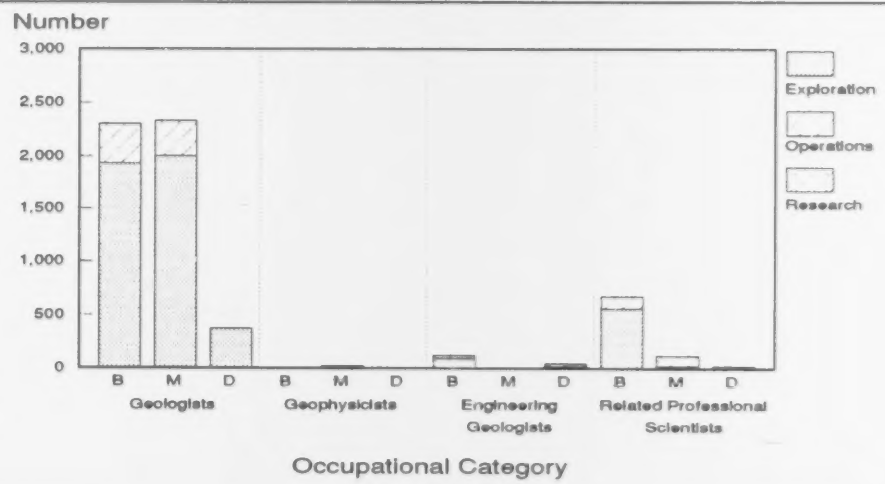
Table 25 and Figure O show the projected current employment levels (as of 12/31/89) by occupational objective and occupational category[1], by degree level:

TABLE 25

Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Domestic Mining and Minerals Industry

	Occupational Category																
	Geologists			Geophysicists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Exploration	1,930	2,000	372	0	0	0	93	0	23	558	23	23	2,581	2,023	418	5,022	83.7
Operations	372	326	0	0	0	0	23	0	23	116	93	0	511	419	23	953	15.9
Research	0	0	0	0	23	0	0	0	0	0	0	0	0	23	0	23	0.4
Total	**2,302**	**2,326**	**372**	**0**	**23**	**0**	**116**	**0**	**46**	**674**	**116**	**23**	**3,092**	**2,465**	**441**	**5,998**	**100.0**
			5,000			**23**			**162**			**813**			**5,998**		

Figure O
Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Domestic Mining and Minerals Industry



1 Although "Geochemists" was one of the occupational categories listed on the survey there were no data provided. Therefore, that category has been omitted in the tabulations.

2. Number Hired in 1989

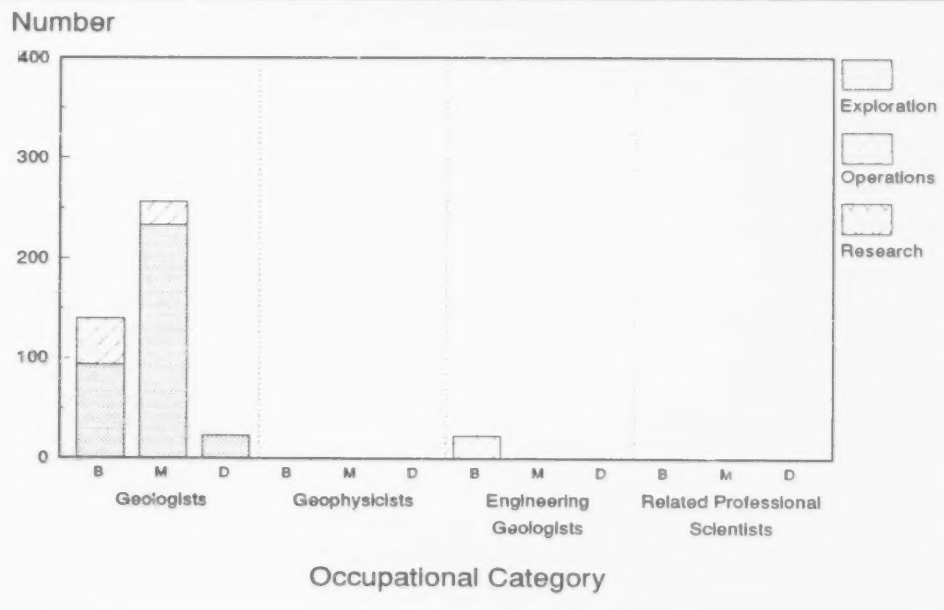
Employers provided the number of geoscientists actually hired in 1989, as shown in Table 26 and Figure P:

TABLE 26

Number of Geoscientists Actually Hired in 1989
By Occupational Objective, Occupational Category, and Degree Level
Domestic Mining and Minerals Industry

	Occupational Category																
	Geologists			Geophysicists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Exploration	93	233	23	0	0	0	0	0	0	0	0	0	93	233	23	349	79.0
Operations	47	23	0	0	0	0	23	0	0	0	0	0	70	23	0	93	21.0
Research	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**140**	**256**	**23**	**0**	**0**	**0**	**23**	**0**	**0**	**0**	**0**	**0**	**163**	**256**	**23**	**442**	**100.0**
			419			**0**			**23**			**0**			**442**		

Figure P
Number of Geoscientists Actually Hired in 1989
by Occupational Objective, Occupational Category, and Degree Level
Domestic Mining and Minerals Industry



3. Projected Hiring for 1990

Employers provided the number of expected hires for 1990. Those estimates project the number of new hires (i.e., those to be hired directly from colleges/universities) and experienced hires. Table 27 shows projections for new hires, by occupational objective, occupational category, and degree level:

TABLE 27

Projected New (Inexperienced) Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Domestic Mining and Minerals Industry

	Occupational Category																
	Geologists			Geophysicists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Exploration	23	70	0	0	0	0	0	0	0	70	0	0	93	70	0	163	100.0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Research	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**23**	**70**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**70**	**0**	**0**	**93**	**70**	**0**	**163**	**100.0**
			93			**0**			**0**			**70**			**163**		

Table 28 shows projected 1990 hiring for experienced geoscientists:

TABLE 28

Projected Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Domestic Mining and Minerals Industry

	Occupational Category																
	Geologists			Geophysicists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Exploration	93	256	70	0	23	0	0	23	0	70	0	0	163	302	70	535	100.0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Research	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**93**	**256**	**70**	**0**	**23**	**0**	**0**	**23**	**0**	**70**	**0**	**0**	**163**	**302**	**70**	**535**	**100.0**
			419			**23**			**23**			**70**			**535**		

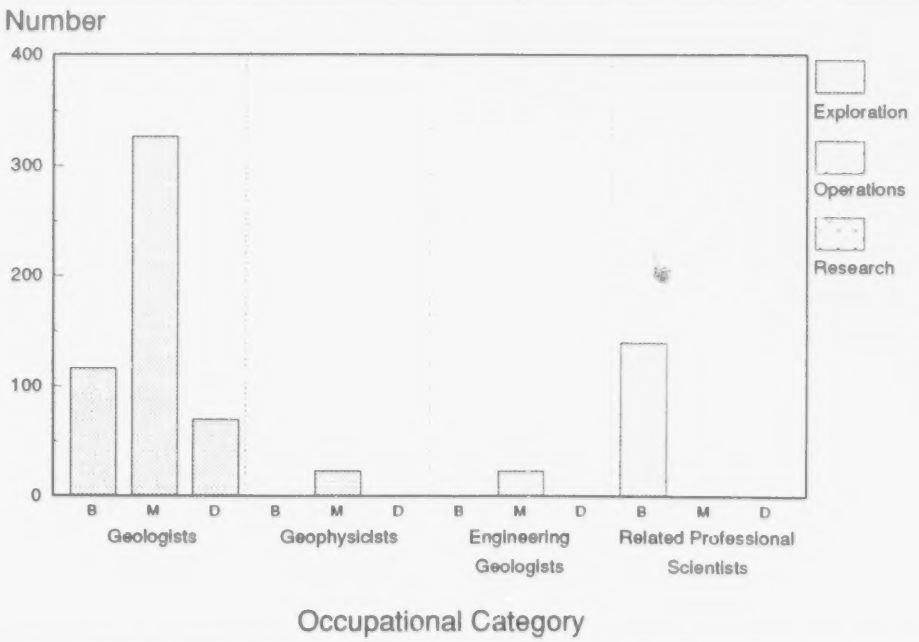
Table 29 and Figure Q present the total projected hiring (inexperienced and experienced) for 1990 for the domestic mining and minerals industry:

TABLE 29

Projected New (Inexperienced) and Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Domestic Mining and Minerals Industry

	Occupational Category																
	Geologists			Geochemists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Exploration	116	326	70	0	23	0	0	23	0	140	0	0	256	372	70	698	100.0
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Research	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**116**	**326**	**70**	**0**	**23**	**0**	**0**	**23**	**0**	**140**	**0**	**0**	**256**	**372**	**70**	**698**	**100.0**
			512			**23**			**23**			**140**			**698**		

Figure Q
Projected Total Hires for 1990
by Occupational Objective, Occupational Category, and Degree Level
Domestic Mining and Minerals Industry



4. Projected Losses for 1990

Table 30 presents the number expected to be lost in 1990, due to resignations, retirements, and terminations:

TABLE 30

Projected Losses for 1990
By Occupational Category and Degree Level
Domestic Mining and Minerals Industry

	Occupational Category																
	Geologists			Geophysicists			Engineering Geologists			Related Professional Scientists			TOTALS				
Reason for Loss	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Resignations	23	23	0	0	0	0	0	0	0	0	0	0	23	23	0	46	5.8
Retirements	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Terminations	46	116	23	0	0	0	0	0	0	558	0	0	604	116	23	743	94.2
Total	**69**	**139**	**23**	**0**	**0**	**0**	**0**	**0**	**0**	**558**	**0**	**0**	**627**	**139**	**23**	**789**	**100.0**
			231			0			0			558			789		

5. Net Gain/Loss in Employment

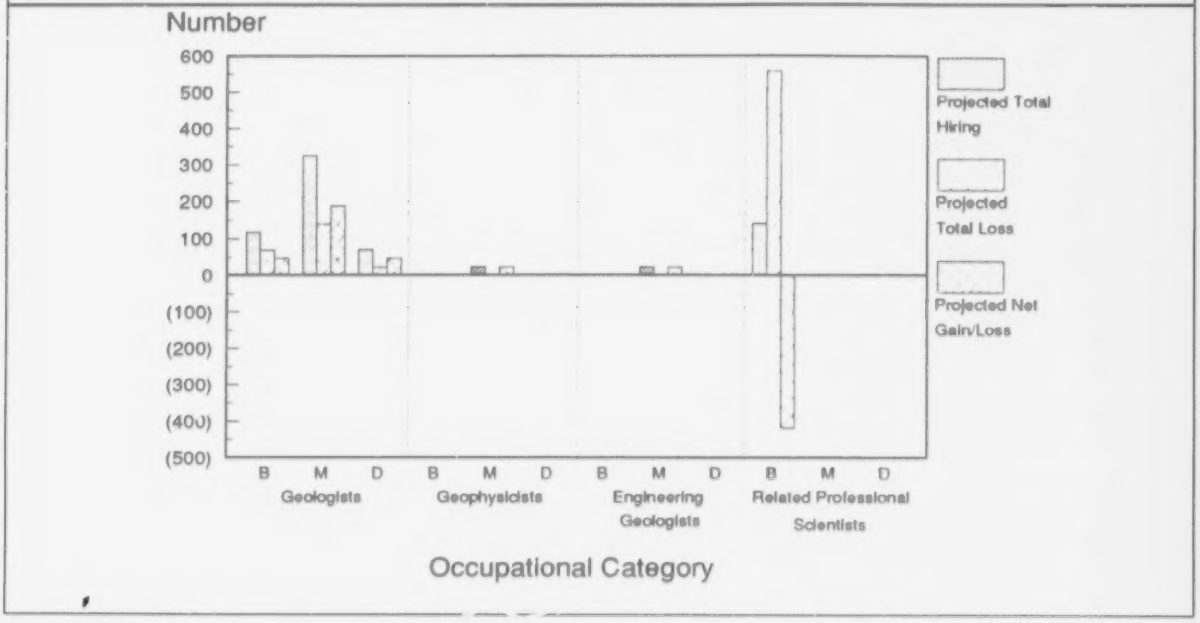
The difference between the projected total hiring and the projected total employment loss provides the net gain. Table 31 and Figure R present the net gain/loss for the domestic mining and minerals industry:

TABLE 31

Projected Net Gain/Loss in Employment
Domestic Mining and Minerals Industry

	Occupational Category															
	Geologists			Geophysicists			Engineering Geologists			Related Professional Scientists			TOTALS			
	B	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**
Projected Total Hiring	116	326	70	0	23	0	0	23	0	140	0	0	256	372	70	698
Projected Total Loss	69	139	23	0	0	0	0	0	0	558	0	0	627	139	23	789
Projected Net Gain/Loss	**47**	**187**	**47**	**0**	**23**	**0**	**0**	**23**	**0**	**-418**	**0**	**0**	**-371**	**233**	**47**	**-91**

Figure R
Projected Net Gain/Loss in Employment
by Occupational Category and Degree Level
Domestic Mining and Minerals Industry



6. Approximate Starting Salaries for Inexperienced New Hires

The approximate starting salaries for inexperienced new hires by degree level are as follows:

Degree Level	Approximate Starting Salary
BA/BS	$ 26,667
MA/MS	$ 31,875
PhD	$ 35,833

C. Federal and State Government Agencies - Federal

Appendix, Tables III.A-F

1. Current Employment Levels

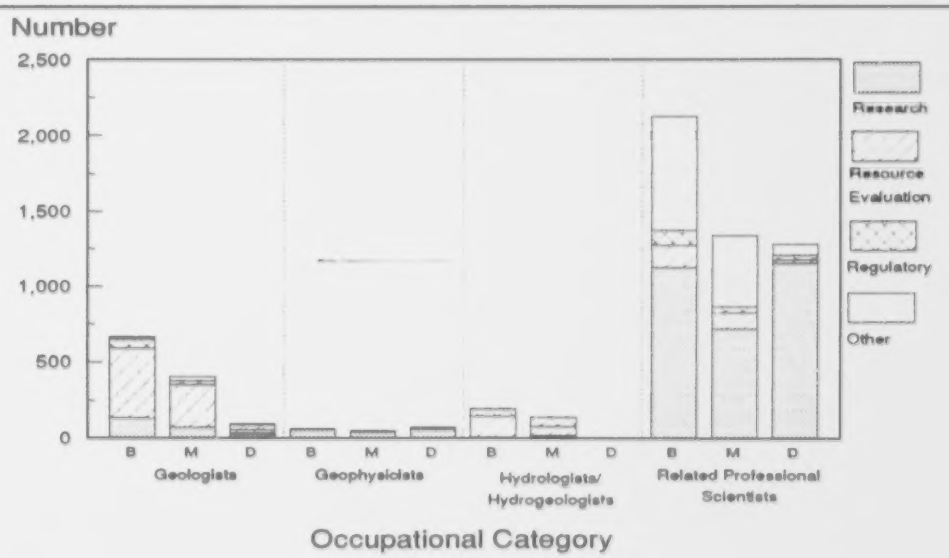
Seven federal government agencies responded to the survey. Table 32 and Figure S show projected current employment levels (as of 12/31/89) according to occupational objective and occupational category, by degree level:

TABLE 32

Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Federal Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	134	74	34	54	40	60	7	20	0	1,128	722	1,154	1,323	906	1,248	3,477	53.7
Resource Evaluation	456	275	20	0	0	0	141	60	0	148	107	20	745	442	40	1,227	18.9
Regulatory	60	27	34	7	7	13	47	60	0	101	40	34	215	134	81	430	6.6
Other	13	27	7	0	0	0	0	0	0	752	470	74	765	497	81	1,343	20.7
Total	**663**	**403**	**95**	**61**	**47**	**73**	**195**	**140**	**0**	**2,129**	**1,389**	**1,282**	**3,048**	**1,979**	**1,450**	**6,477**	**99.9**
			1,161			181			335			4,800			6,477		

Figure S
Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Federal Government Agencies



2. Number Hired in 1989

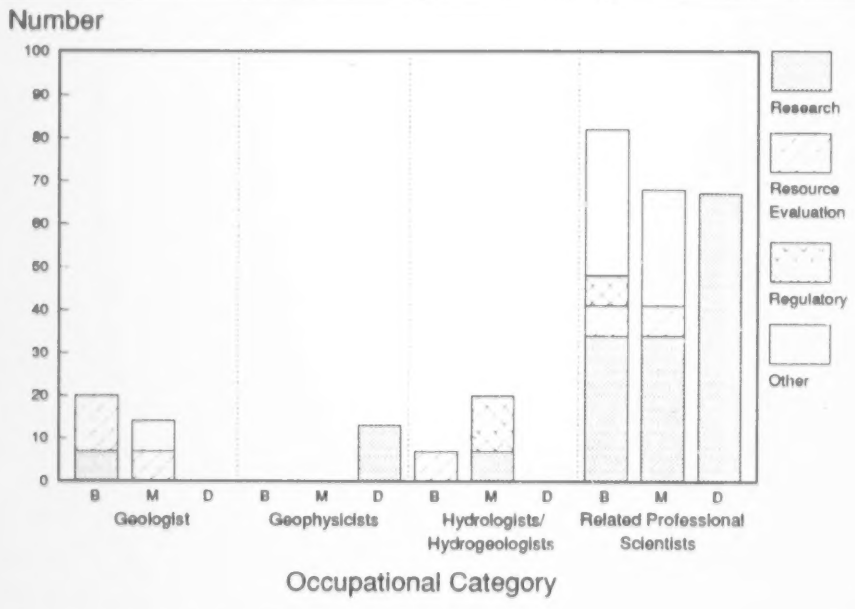
Federal agencies provided the number of geoscientists actually hired in 1989, as shown in Table 33 and Figure T:

TABLE 33

Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level Federal Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	7	0	0	0	0	13	0	7	0	34	34	67	41	41	80	162	55.7
Resource Evaluation	13	7	0	0	0	0	7	0	0	7	7	0	27	14	0	41	14.1
Regulatory	0	0	0	0	0	0	0	13	0	7	0	0	7	13	0	20	6.9
Other	0	7	0	0	0	0	0	0	0	34	27	0	34	34	0	68	23.4
Total	**20**	**14**	**23**	**0**	**0**	**13**	**7**	**20**	**0**	**82**	**68**	**67**	**109**	**102**	**80**	**291**	**100.1**
			34			**13**			**27**			**217**			**291**		

Figure T
Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level Federal Government Agencies



3. Projected Hiring for 1990

Employers provided the number of expected hires for 1990. Those estimates project the number of new hires (i.e., those to be hired directly from colleges/universities) and experienced hires. Table 34 shows projections for new hires, by occupational objective, occupational category, and degree level:

TABLE 34

Projected New (Inexperienced) Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Federal Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	7	7	0	0	0	0	0	0	0	20	13	7	27	20	7	54	61.4
Resource Evaluation	7	0	0	0	0	0	7	0	0	0	0	0	14	0	0	14	15.9
Regulatory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	0	0	7	13	0	7	13	0	20	22.7
Total	**14**	**7**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**27**	**26**	**7**	**48**	**33**	**7**	**88**	**100.0**
			21			**0**			**7**			**60**			**88**		

Table 35 shows projected 1990 hiring for experienced geoscientists:

TABLE 35

Projected Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Federal Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	7	7	0	0	0	0	0	0	0	7	7	7	14	14	7	35	32.1
Resource Evaluation	13	13	0	0	0	0	0	0	0	7	20	7	20	33	7	60	55.1
Regulatory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	0	0	7	7	0	7	7	0	14	12.8
Total	**20**	**20**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**34**	**14**	**41**	**54**	**14**	**109**	**100.0**
			40			**0**			**0**			**69**			**109**		

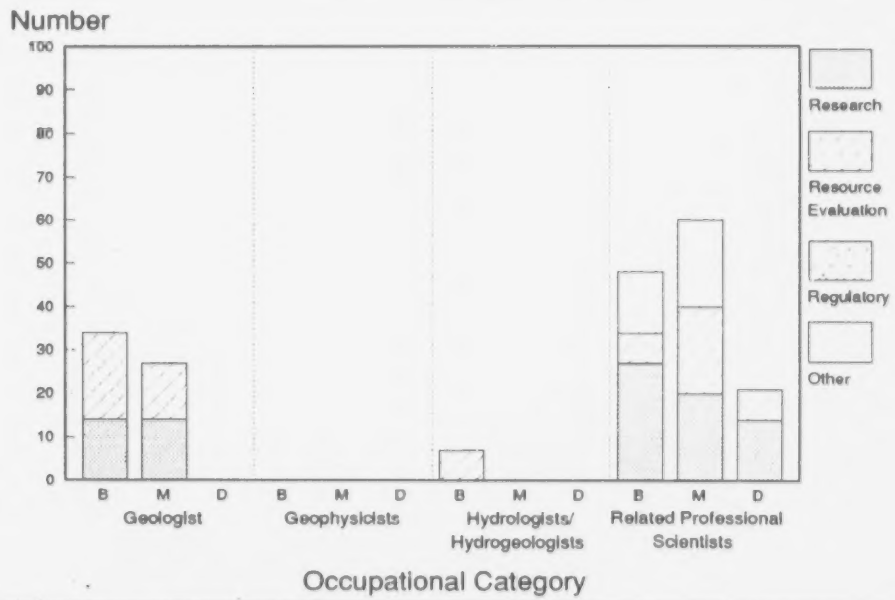
Table 36 and Figure U present the total projected hiring (inexperienced and experienced) for 1990 for federal government agencies:

TABLE 36

Projected New (Inexperienced) and Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Federal Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Research	14	14	0	0	0	0	0	0	0	27	20	14	41	34	14	89	45.2
Resource Evaluation	20	13	0	0	0	0	7	0	0	7	20	7	34	33	7	74	37.6
Regulatory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	0	0	14	20	0	14	20	0	34	17.2
Total	**34**	**27**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**48**	**60**	**21**	**89**	**87**	**21**	**197**	**100.0**
			61			**0**			**7**			**129**			**197**		

Figure U
Projected Total Hires for 1990
by Occupational Objective, Occupational Category, and Degree Level
Federal Government Agencies



4. Projected Losses for 1990

Table 37 presents the number expected to be lost in 1990, due to resignations, retirements, and terminations:

TABLE 37

Projected Losses for 1990
By Occupational Category and Degree Level
Federal Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Reason for Loss	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Resignations	7	7	0	0	0	0	0	0	0	13	27	13	20	34	13	67	23.9
Retirements	20	20	0	0	0	0	7	0	0	60	40	13	87	60	13	160	57.1
Terminations	0	0	0	0	0	0	0	0	0	27	13	13	27	13	13	53	18.9
Total	**27**	**27**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**100**	**80**	**39**	**134**	**107**	**39**	**280**	**99.9**
			54			**0**			**7**			**219**			**280**		

5. Net Gain/Loss in Employment

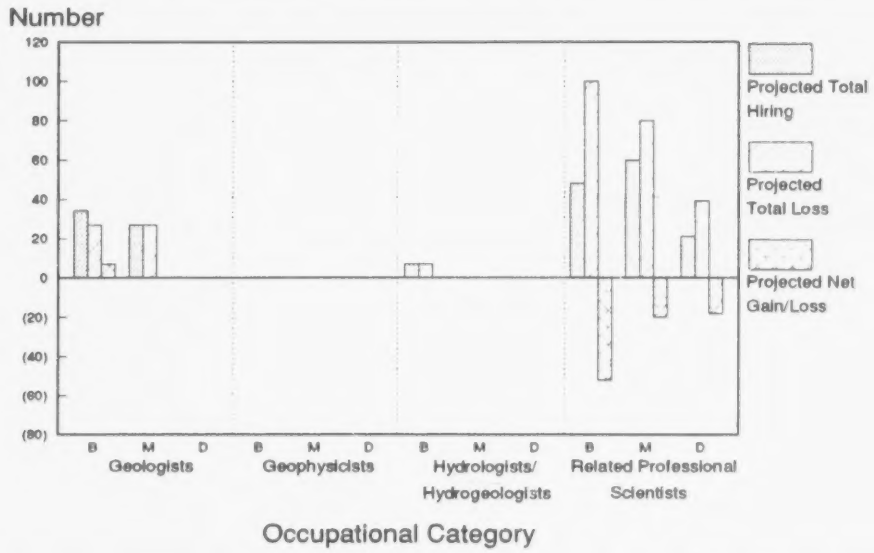
The difference between the projected total hiring and the projected total employment loss provides the net gain. Table 38 and Figure V present the net gain/loss for federal government agencies:

TABLE 38

Projected Net Gain/Loss in Employment
Federal Government Agencies

	Occupational Category															
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS			
	B	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**
Projected Total Hiring	34	27	0	0	0	0	7	0	0	48	60	21	89	87	21	197
Projected Total Loss	27	27	0	0	0	0	7	0	0	100	80	39	134	107	39	280
Projected Net Gain/Loss	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-52**	**-20**	**-18**	**-45**	**-20**	**-18**	**-83**

Figure V
Projected Net Gain/Loss in Employment
by Occupational Category and Degree Level
Federal Government Agencies



6. Approximate Starting Salaries for Inexperienced New Hires

The approximate starting salaries for inexperienced new hires by degree level are as follows:

Degree Level	Approximate Starting Salary
BA/BS	$ 22,500
MA/MS	$ 24,167
PhD	$ 28,125

C. Federal and State Government Agencies - State

Appendix, Tables III.G-L

1. Current Employment Levels

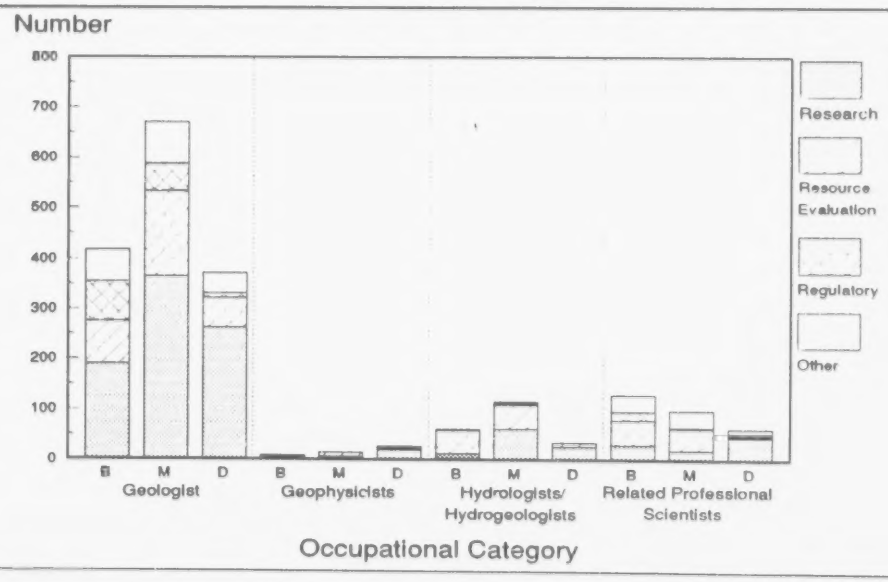
Thirty-seven state government agencies responded to the survey. Table 39 and Figure W show projected current employment levels (as of 12/31/89) according to occupational objective and occupational category, by degree level:

TABLE 39

Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
State Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	190	365	262	2	6	20	12	61	26	30	20	46	234	452	354	1,040	51.9
Resource Evaluation	85	168	59	2	8	2	46	48	8	48	42	2	181	266	71	518	25.9
Regulatory	79	54	10	0	0	0	0	2	0	18	2	4	97	58	14	169	8.4
Other	63	83	40	4	0	4	2	4	0	32	34	10	101	121	54	276	13.8
Total	**417**	**670**	**371**	**8**	**14**	**26**	**60**	**115**	**34**	**128**	**98**	**62**	**613**	**897**	**493**	**2,003**	**100.0**
			1,458			**48**			**209**			**288**			**2,003**		

Figure W
Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
State Government Agencies



2. Number Hired in 1989

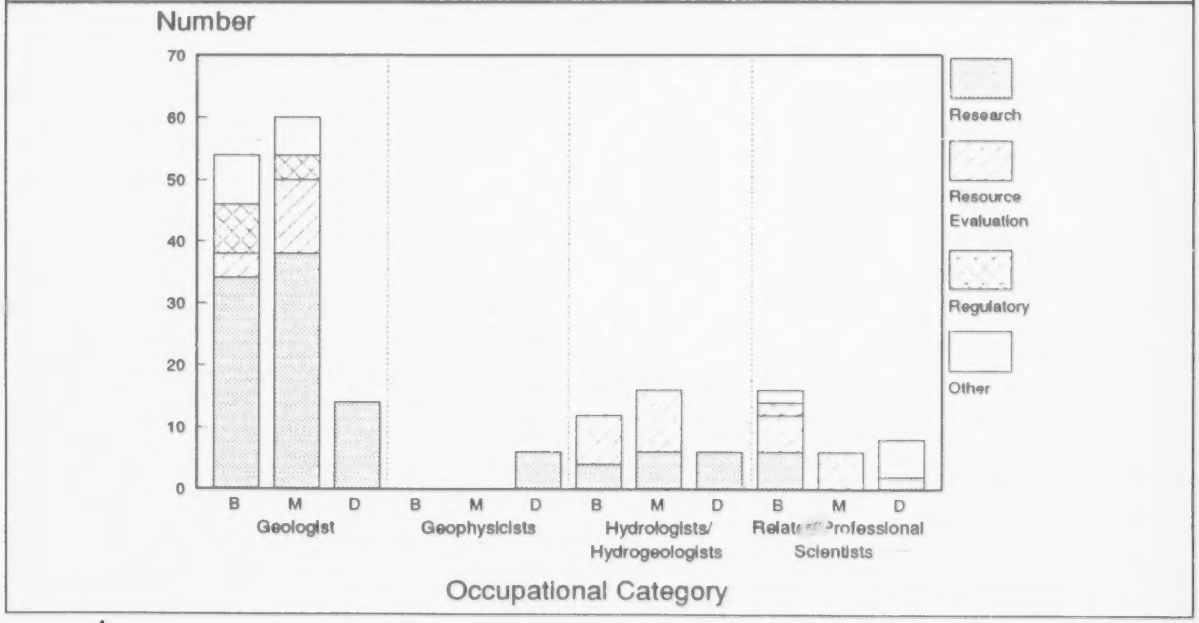
State agencies provided the number of geoscientists actually hired in 1989, as shown in Table 40 and Figure X:

TABLE 40

Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level State Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	34	38	14	0	0	6	4	6	6	6	0	2	44	44	28	116	58.6
Resource Evaluation	4	12	0	0	0	0	8	10	0	6	6	0	18	28	0	46	23.2
Regulatory	8	4	0	0	0	0	0	0	0	2	0	0	10	4	0	14	7.1
Other	8	6	0	0	0	0	0	0	0	2	0	6	10	6	6	22	11.1
Total	**54**	**60**	**14**	**0**	**0**	**6**	**12**	**16**	**6**	**16**	**6**	**8**	**82**	**82**	**34**	**198**	**100.0**
			128			**6**			**34**			**30**			**198**		

Figure X
Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level State Government Agencies



3. Projected Hiring for 1990

Employers provided the number of expected hires for 1990. Those estimates project the number of new hires (i.e., those to be hired directly from colleges/universities) and experienced hires. Table 41 shows projections for new hires, by occupational objective, occupational category, and degree level:

TABLE 41

Projected New (Inexperienced) Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
State Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	10	24	0	0	0	0	0	2	0	4	2	2	14	28	2	44	56.4
Resource Evaluation	0	8	2	0	0	0	6	10	0	0	0	0	6	18	2	26	33.3
Regulatory	4	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	5.1
Other	2	0	0	0	0	0	0	0	0	2	0	0	4	0	0	4	5.1
Total	**16**	**32**	**2**	**0**	**0**	**0**	**6**	**12**	**0**	**6**	**2**	**2**	**28**	**46**	**4**	**78**	**99.9**
			50			**0**			**18**			**10**			**78**		

Table 42 shows projected 1990 hiring for experienced geoscientists:

TABLE 42

Projected Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
State Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	10	16	4	0	2	0	2	10	0	4	4	0	16	32	4	52	68.4
Resource Evaluation	0	4	2	0	0	0	0	0	0	0	0	0	0	4	2	6	7.9
Regulatory	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	4	6	2	0	0	0	0	0	0	2	4	0	6	10	2	18	23.7
Total	**14**	**26**	**8**	**0**	**2**	**0**	**2**	**10**	**0**	**6**	**8**	**0**	**22**	**46**	**8**	**76**	**100.0**
			48			**2**			**12**			**14**			**76**		

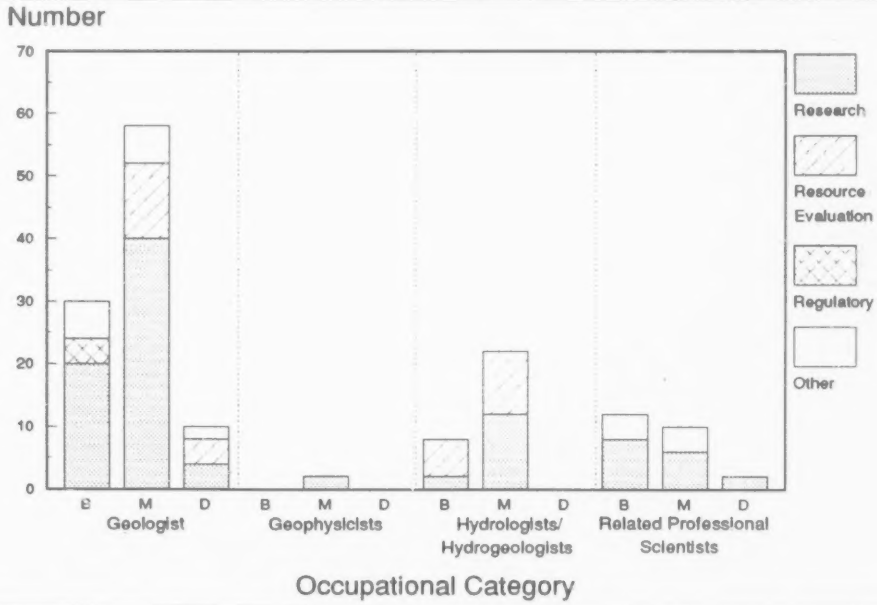
Table 43 and Figure Y present the total projected hiring (inexperienced and experienced) for 1990 for state government agencies:

TABLE 43

Projected New (Inexperienced) and Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
State Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Research	20	40	4	0	2	0	2	12	0	8	6	2	30	60	6	96	62.3
Resource Evaluation	0	12	4	0	0	0	6	10	0	0	0	0	6	22	4	32	20.8
Regulatory	4	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	2.6
Other	6	6	2	0	0	0	0	0	0	4	4	0	10	10	2	22	14.3
Total	**30**	**58**	**10**	**0**	**2**	**0**	**8**	**22**	**0**	**12**	**10**	**2**	**50**	**92**	**12**	**154**	**100.0**
			98			**2**			**30**			**24**			**154**		

Figure Y
Projected Total Hires for 1990
by Occupational Objective, Occupational Category, and Degree Level
State Government Agencies



4. Projected Losses for 1990

Table 44 presents the number expected to be lost in 1990, due to resignations, retirements, and terminations:

TABLE 44

Projected Losses for 1990
By Occupational Category and Degree Level
State Government Agencies

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS				
Reason for Loss	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Resignations	14	14	2	0	4	0	2	10	0	2	0	2	18	28	4	50	69.4
Retirements	4	6	6	0	0	0	0	0	0	0	2	4	4	8	10	22	30.6
Terminations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**18**	**20**	**8**	**0**	**4**	**0**	**2**	**10**	**0**	**2**	**2**	**6**	**22**	**36**	**14**	**72**	**100.0**
			46			4			12			10			72		

5. Net Gain/Loss in Employment

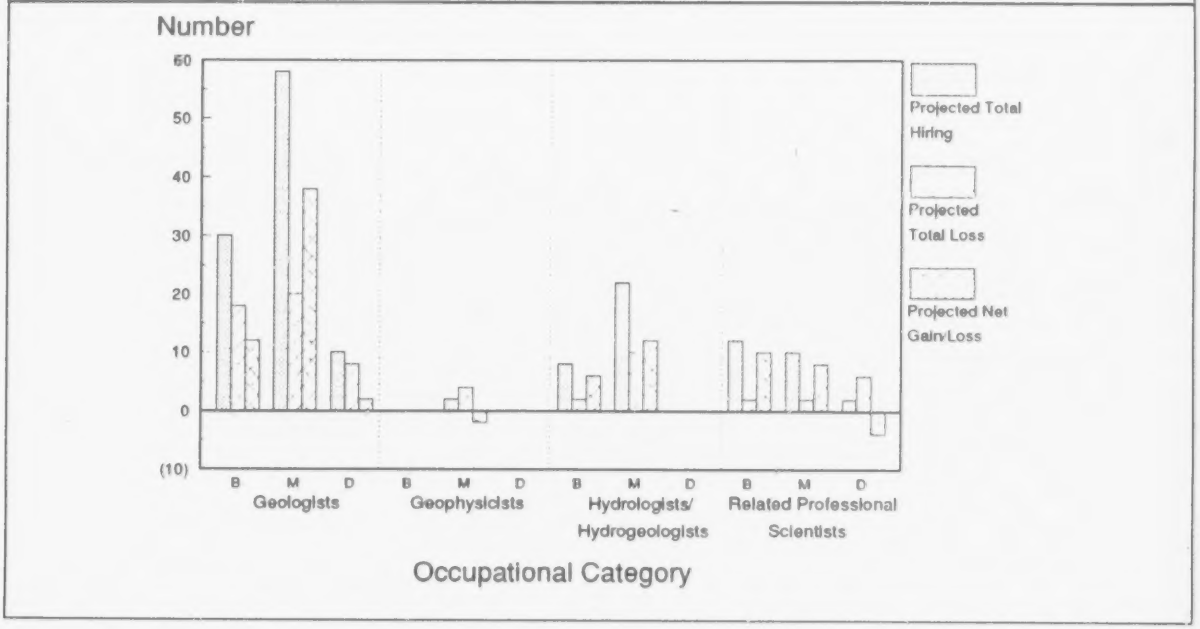
The difference between the projected total hiring and the projected total employment loss provides the net gain. Table 45 and Figure Z present the net gain/loss for state government agencies:

TABLE 45

Projected Net Gain/Loss in Employment
State Government Agencies

	Occupational Category															
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			TOTALS			
	B	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**
Projected Total Hiring	30	58	10	0	2	0	8	22	0	12	10	2	50	92	12	154
Projected Total Loss	18	20	8	0	4	0	2	10	0	2	2	6	22	36	14	72
Projected Net Gain/Loss	**12**	**38**	**2**	**0**	**-2**	**0**	**6**	**12**	**0**	**10**	**8**	**-4**	**28**	**56**	**-2**	**82**

Figure Z
Projected Net Gain/Loss in Employment
by Occupational Category and Degree Level
State Government Agencies



6. Approximate Starting Salaries for Inexperienced New Hires

The approximate starting salaries for inexperienced new hires by degree level are as follows:

Degree Level	Approximate Starting Salary
BA/BS	$ 21,500
MA/MS	$ 26,029
PhD	$ 31,042

D. Research Institutions and DOE-funded National Laboratories - Research Institutions

Appendix, Tables IV.A-D

1. Current Employment Levels

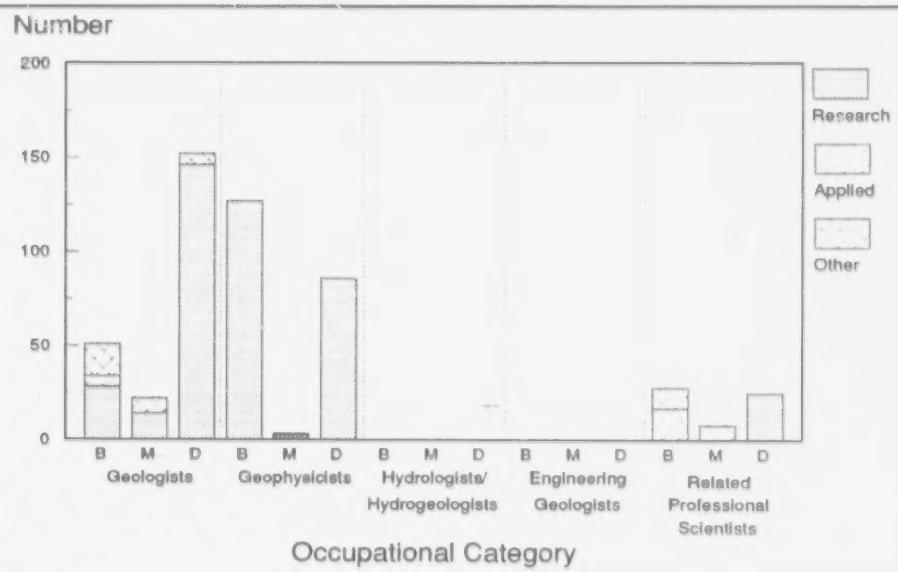
This category was expanded to include research institutions as well as DOE-funded national laboratories. Five such research institutions returned employment and hiring information. Table 46 and Figure a present current employment levels (as of 12/31/89) according to occupational objective and occupational category, by degree level:

TABLE 46

Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Research Institutions

	Occupational Category																			
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	28	14	146	127	3	86	0	0	0	0	0	0	0	0	25	155	17	257	429	85.5
Applied	6	0	0	0	0	0	0	0	0	0	0	0	17	8	0	23	8	0	31	6.2
Other	17	8	6	0	0	0	0	0	0	0	0	0	11	0	0	28	8	6	42	8.4
Total	51	22	152	127	3	86	0	0	0	0	0	0	28	8	25	206	33	263	502	100.1
			225			216			0			0			61			502		

Figure a
Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Research Institutions



2. Number Hired in 1989

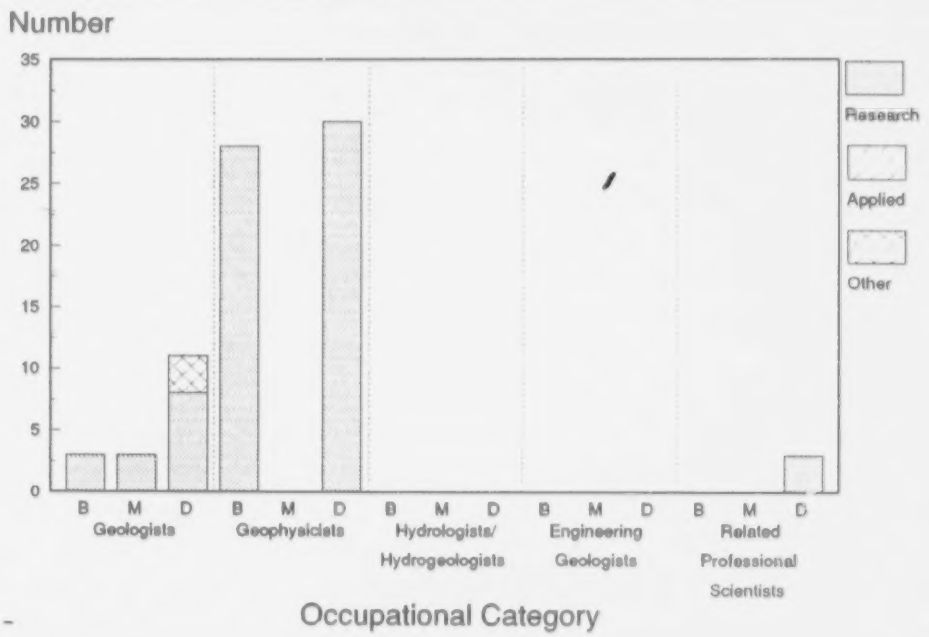
Research institutions provided the number of geoscientists actually hired in 1989, as shown in Table 47 and Figure b:

TABLE 47

Number of Geoscientists Actually Hired in 1989
by Occupational Objective, Occupational Category, and Degree Level
Research Institutions

	Occupational Category																		
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	3	3	8	28	0	30	0	0	0	0	0	0	0	0	3	31	3	41	75	96.2
Applied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3.8
Total	3	3	11	28	0	30	0	0	0	0	0	0	0	0	3	31	3	44	78	100.0
			17			58			0			0			3			78		

Figure b
Number of Geoscientists Actually Hired in 1989
by Occupational Objective, Occupational Category, and Degree Level
Research Institutions



3. Projected Hiring for 1990

Employers provided the number of expected hires for 1990. Those estimates project the number of new hires (i.e., those to be hired directly from colleges/universities) and experienced hires. Table 48 shows projections for new hires, by occupational objective, occupational category, and degree level:

TABLE 48

Projected New (Inexperienced) Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Research Institutions

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	8	0	8	28	0	14	0	0	0	0	0	0	0	0	0	36	0	22	58	100.0
Applied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**8**	**0**	**8**	**28**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**36**	**0**	**22**	**58**	**100.0**
			16			42			0			0			0			58		

Table 49 shows projected 1990 hiring for experienced geoscientists:

TABLE 49

Projected Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Research Institutions

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	6	6	100.0
Applied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**6**	**6**	**100.0**
			3			0			0			0			3			6		

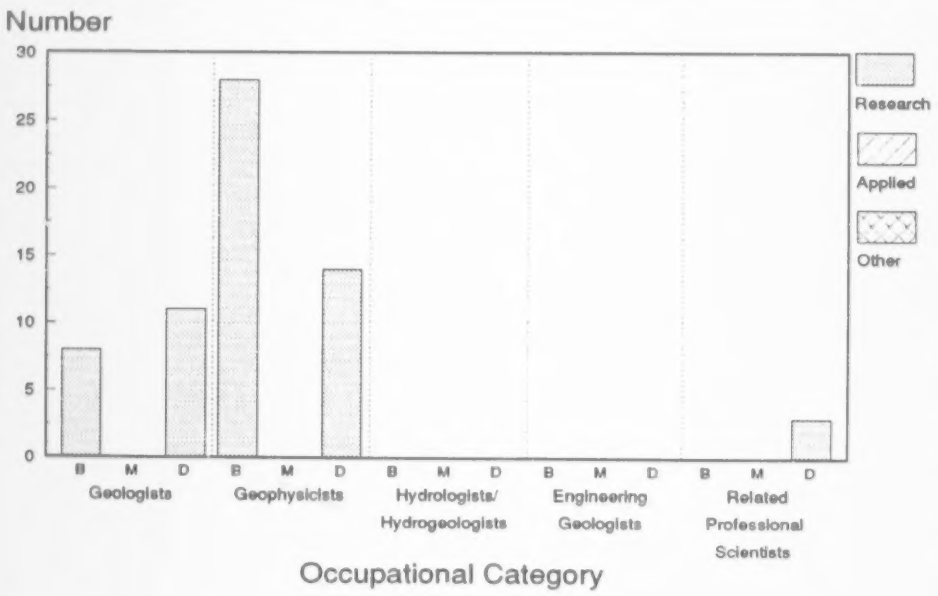
Table 50 and Figure c present the total projected hiring (inexperienced and experienced) for 1990 for research institutions:

TABLE 50

Projected New (Inexperienced) and Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Research Institutions

	Occupational Category																		
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	8	0	11	28	0	14	0	0	0	0	0	0	0	0	3	36	0	28	64	100.0
Applied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**8**	**0**	**11**	**28**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**36**	**0**	**28**	**64**	**100.0**
			19			42			0			0			3			64		

Figure c
Projected Total Hires for 1990
by Occupational Objective, Occupational Category, and Degree Level
Research Institutions



4. Projected Losses for 1990

Table 51 presents the number expected to be lost in 1990, due to resignations, retirements, and terminations:

TABLE 51

Projected Losses for 1990
By Occupational Category and Degree Level
Research Institutions

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS				
Reason for Loss	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Resignations	6	0	6	8	0	8	0	0	0	0	0	0	0	0	3	14	0	17	31	91.2
Retirements	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Terminations	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	8.8
Total	**6**	**0**	**9**	**8**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**14**	**0**	**20**	**34**	**100.0**
			15			**16**			**0**			**0**			**3**			**34**		

5. Net Gain/Loss in Employment

The difference between the projected total hiring and the projected total employment loss provides the net gain. Table 52 and Figure d present the net gain/loss for research institutions:

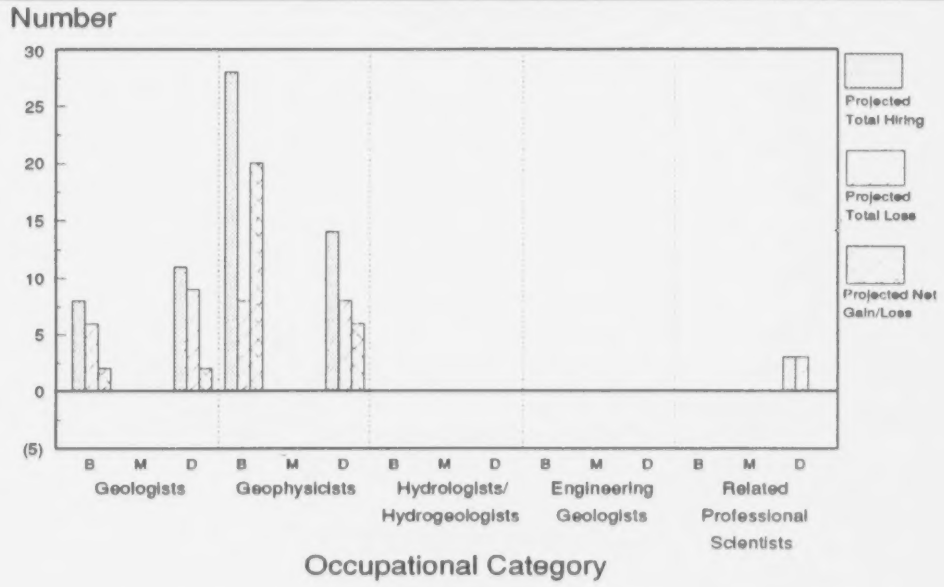
TABLE 52

Projected Net Gain/Loss in Employment
Research Institutions

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
	B	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**
Projected Total Hiring	8	0	11	28	0	14	0	0	0	0	0	0	0	0	3	36	0	28	64
Projected Total Loss	6	0	9	8	0	8	0	0	0	0	0	0	0	0	3	14	0	20	34
Projected Net Gain/Loss	**2**	**0**	**2**	**20**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**22**	**0**	**8**	**30**

Figure d
Projected Net Gain/Loss in Employment
Research Institutions



6. Approximate Starting Salaries for Inexperienced New Hires

The approximate starting salaries for inexperienced new hires by degree level are as follows:

Degree Level	Approximate Starting Salary
BA/BS	$ 20,000
MA/MS	$ 30,000
PhD	$ 36,250

D. Research Institutions and DOE-funded National Laboratories - DOE-funded National Laboratories

Appendix, Tables IV. E-J

1. Current Employment Levels

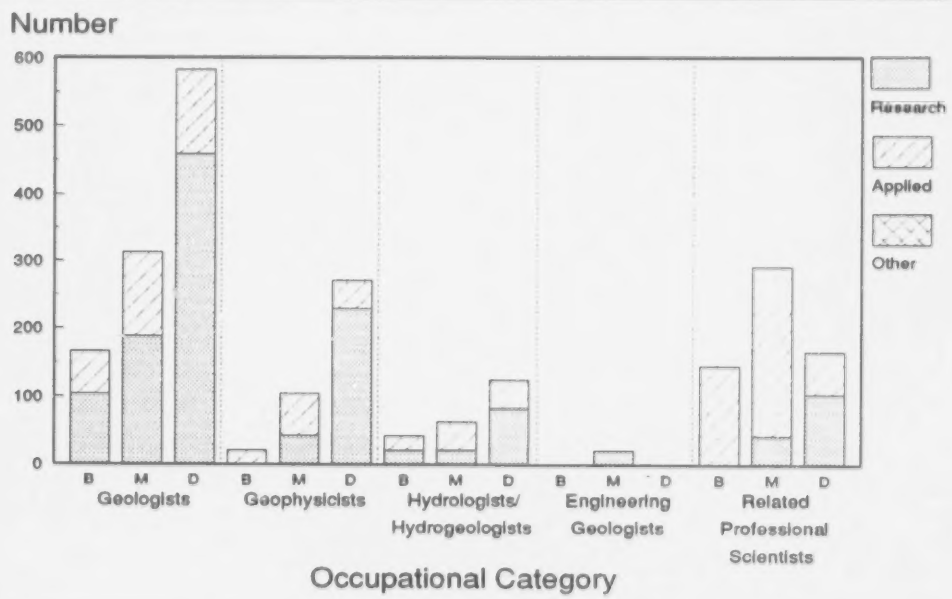
Four DOE-funded national laboratories returned employment and hiring information. Table 53 and Figure e present current employment levels (as of 12/31/89) according to occupational objective and occupational category, by degree level:

TABLE 53

Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
DOE-funded National Laboratories

	Occupational Category																			
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	104	188	458	0	42	229	21	21	83	0	21	0	0	42	104	125	314	874	1,313	56.7
Applied	63	125	125	21	63	42	21	42	42	0	0	0	146	250	63	251	480	272	1,003	43.3
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	167	313	583	21	105	271	42	63	125	0	21	0	146	292	167	376	794	1,146	2,316	100.0
			1,063			397			230			21			605			2,316		

Figure e
Current Employment Levels
by Occupational Objective, Occupational Category and Degree Level
DOE-funded National Laboratories



2. Number Hired in 1989

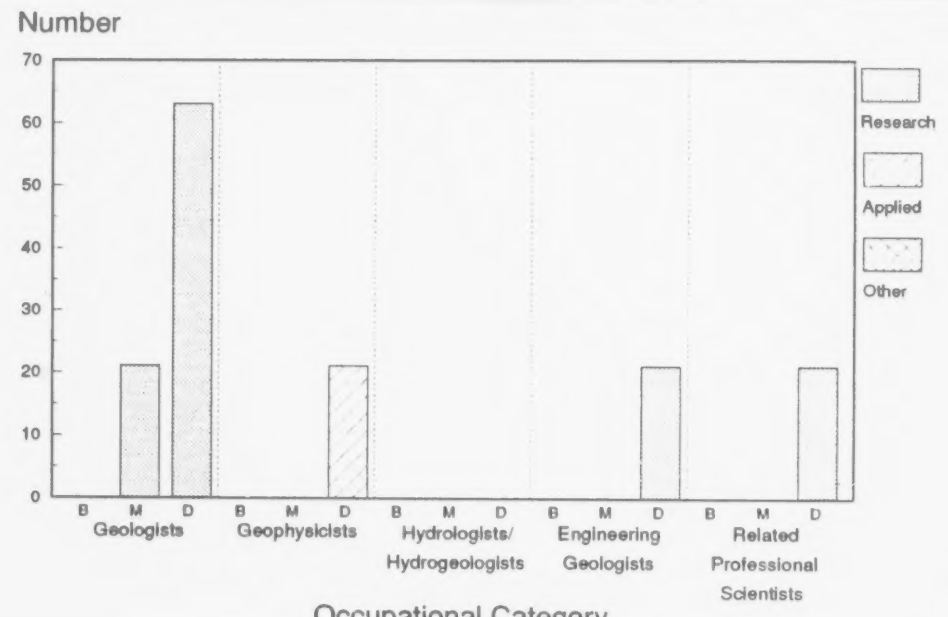
DOE-funded national laboratories provided the number of personnel actually hired in 1989, as shown in Table 54 and Figure f:

TABLE 54

Number of Geoscientists Actually Hired in 1989
by Occupational Objective, Occupational Category, and Degree Level
DOE-funded National Laboratories

	Occupational Category																		
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	0	21	63	0	0	0	0	0	0	0	0	21	0	0	21	0	21	105	126	85.7
Applied	0	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	21	21	14.3
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**0**	**21**	**63**	**0**	**0**	**21**	**0**	**0**	**0**	**0**	**0**	**21**	**0**	**0**	**21**	**0**	**21**	**126**	**147**	**100.0**
			84			**21**			**0**			**21**			**21**			**147**		

Figure f
Number of Geoscientists Actually Hired in 1989
by Occupational Objective, Occupational Category, and Degree Level
DOE-funded National Laboratories



3. Projected Hiring for 1990

Employers provided the number of expected hires for 1990. Those estimates project the number of new hires (i.e., personnel to be hired directly from colleges/universities) and experienced hires. Table 55 shows projections for new hires, by occupational objective, occupational category, and degree level:

TABLE 55

Projected New (Inexperienced) Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
DOE-funded National Laboratories

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Research	0	0	0	0	0	0	0	0	42	0	0	21	0	0	0	0	0	63	63	42.9
Applied	0	0	0	0	21	0	0	42	21	0	0	0	0	0	0	0	63	21	84	57.1
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**0**	**0**	**0**	**0**	**21**	**0**	**0**	**42**	**63**	**0**	**0**	**21**	**0**	**0**	**0**	**0**	**63**	**84**	**147**	**100.0**
			0			**21**			**105**			**21**			**0**			**147**		

Table 56 shows projected 1990 hiring for experienced geoscientists:

TABLE 56

Projected Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
DOE-funded National Laboratories

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Research	0	0	0	0	0	63	0	21	63	0	0	0	0	0	0	0	21	126	147	43.9
Applied	0	0	21	0	21	0	0	21	104	0	0	21	0	0	0	0	42	146	188	56.1
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**0**	**0**	**21**	**0**	**21**	**63**	**0**	**42**	**167**	**0**	**0**	**21**	**0**	**0**	**0**	**0**	**63**	**272**	**335**	**100.0**
			21			**84**			**209**			**21**			**0**			**335**		

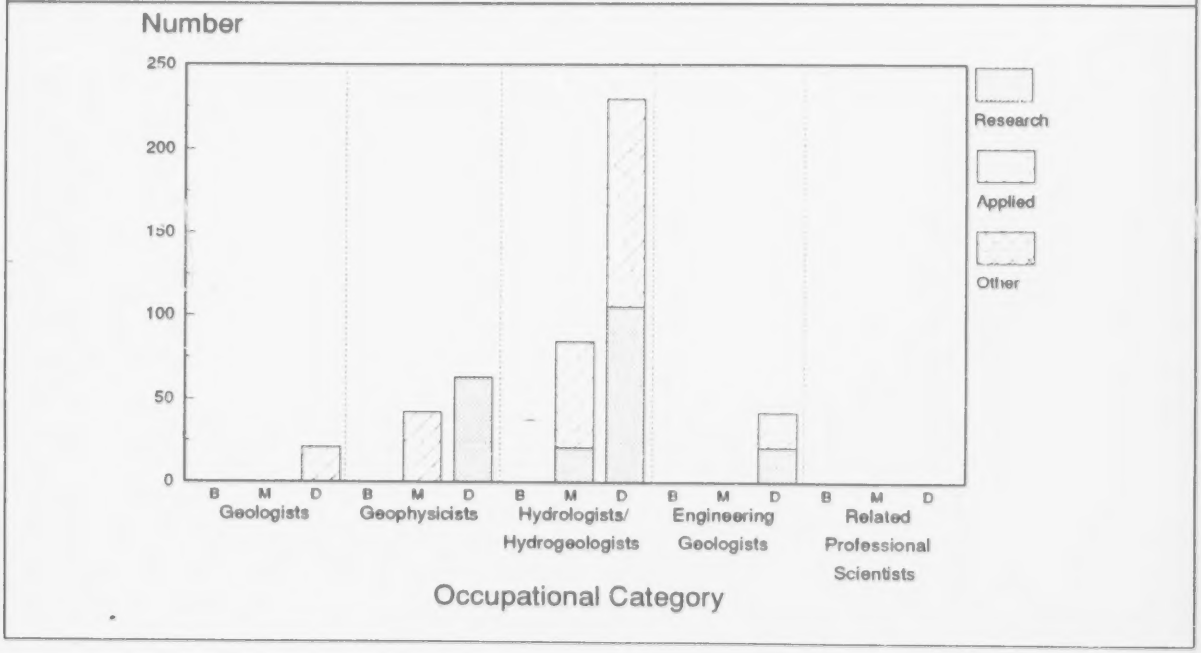
Table 57 and Figure g present the total projected hiring (inexperienced and experienced) for 1990 for DOE-funded national laboratories:

TABLE 57

Projected New (Inexperienced) and Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
DOE-funded National Laboratories

	Occupational Category																		
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Research	0	0	0	0	0	63	0	21	105	0	0	21	0	0	0	0	21	189	210	43.6
Applied	0	0	21	0	42	0	0	63	125	0	0	21	0	0	0	0	105	167	272	56.4
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	0	0	21	0	42	63	0	84	230	0	0	42	0	0	0	0	126	356	482	100.0
			21			105			314			42			0			482		

Figure g
Projected New (Inexperienced) and Experienced Hires for 1990
by Occupational Objective, Occupational Category, and Degree Level
DOE-funded National Laboratories



4. Projected Losses for 1990

Table 58 presents the number expected to be lost in 1990, due to resignations, retirements, and terminations:

TABLE 58

Projected Losses for 1990
By Occupational Category and Degree Level
DOE-funded National Laboratories

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS				
Reason for Loss	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Resignations	0	21	0	0	21	0	0	0	0	0	0	0	0	0	21	0	42	21	63	37.5
Retirements	0	0	21	0	0	21	0	0	21	0	0	0	0	0	42	0	0	105	105	62.5
Terminations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**0**	**21**	**21**	**0**	**21**	**21**	**0**	**0**	**21**	**0**	**0**	**0**	**0**	**0**	**63**	**0**	**42**	**126**	**168**	**100.0**
			42			**42**			**21**			**0**			**63**			**168**		

5. Net Gain/Loss in Employment

The difference between the projected total hiring and the projected total employment loss provides the net gain. Table 59 and Figure h present the net gain/loss for DOE-funded national laboratories:

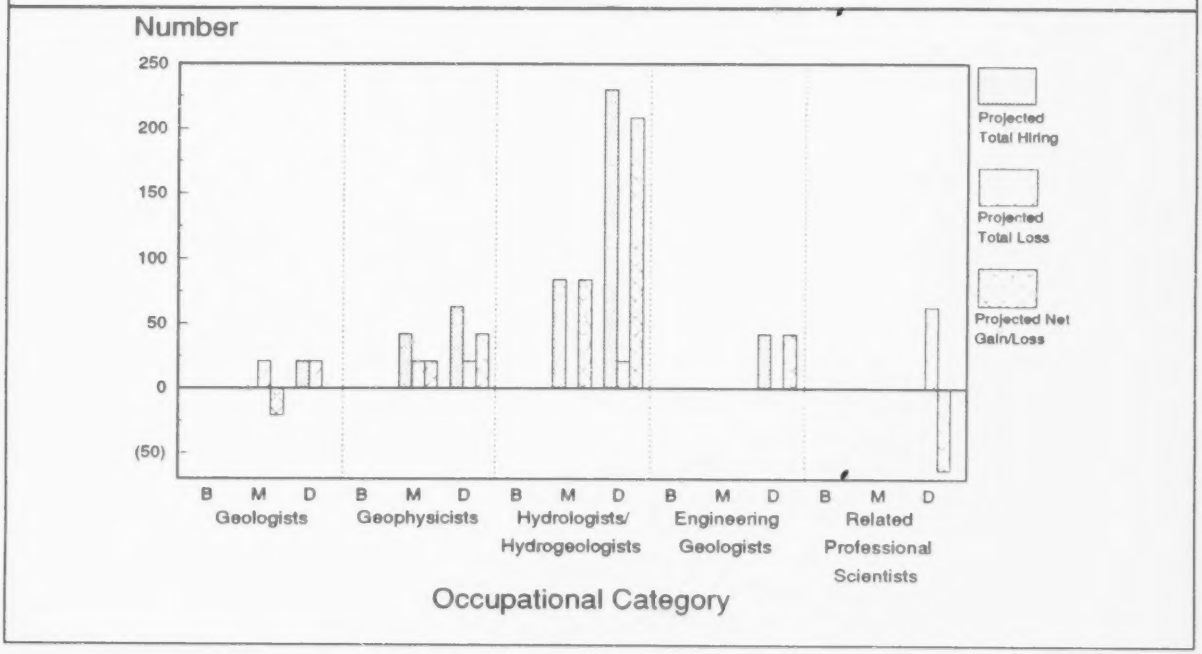
TABLE 59

Projected Net Gain/Loss in Employment
DOE-funded National Laboratories

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
	B	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**
Projected Total Hiring	0	0	21	0	42	63	0	84	230	0	0	42	0	0	0	0	126	356	482
Projected Total Loss	0	21	21	0	21	21	0	0	21	0	0	0	0	0	63	0	42	126	168
Projected Net Gain/Loss	**0**	**-21**	**0**	**0**	**21**	**42**	**0**	**84**	**209**	**0**	**0**	**42**	**0**	**0**	**-63**	**0**	**84**	**230**	**314**

Figure h
Projected Net Gain/Loss in Employment
DOE-funded National Laboratories



6. Approximate Starting Salaries for Inexperienced New Hires

The approximate starting salaries for inexperienced new hires by degree level are as follows:

Degree Level	Approximate Starting Salary
BA/BS	$ 27,500
MA/MS	$ 36,667
PhD	$ 42,500

E. Geoscientific Consulting Firms

Appendix, Tables V.A-F

1. Current Employment Levels

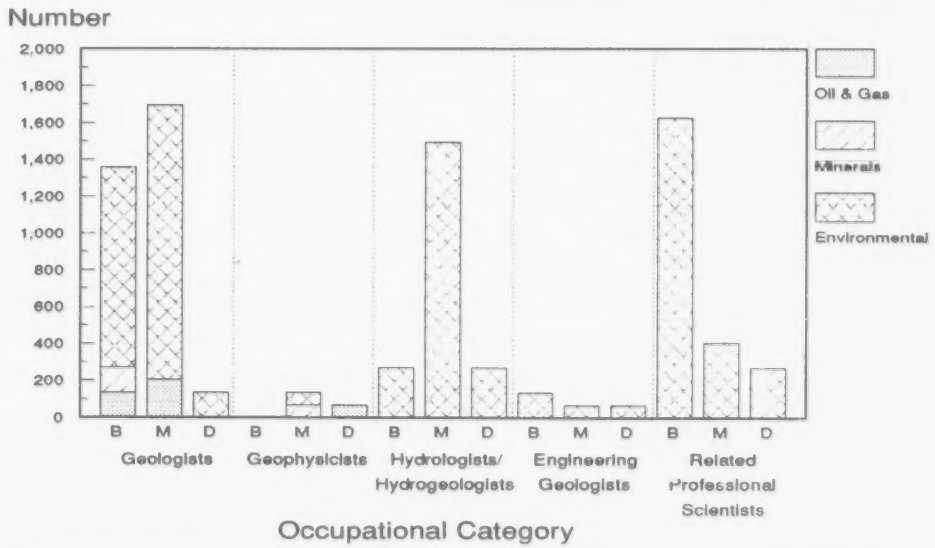
Six geoscientific consulting firms returned employment and hiring information. Table 60 and Figure j present current employment levels (as of 12/31/89) according to occupational objective and occupational category, by degree level:

TABLE 60

Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Geoscientific Consulting Firms

	Occupational Category																		
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Oil and Gas	136	203	0	0	0	68	0	0	0	0	0	0	0	0	0	136	203	68	407	5.1
Minerals	136	0	0	0	68	0	0	0	0	0	0	0	0	0	0	136	68	0	204	2.5
Environmental	1,085	1,492	136	0	68	0	271	1,492	271	136	68	68	1,627	407	271	3,119	3,527	746	7,392	92.4
Total	**1,357**	**1,695**	**136**	**0**	**136**	**68**	**271**	**1,492**	**271**	**136**	**68**	**68**	**1,627**	**407**	**271**	**3,391**	**3,798**	**814**	**8,003**	**100.0**
			3,188			204			2,034			272			2,305			8,003		

Figure j
Current Employment Levels
by Occupational Objective, Occupational Category, and Degree Level
Geoscientific Consulting Firms



2. Number Hired in 1989

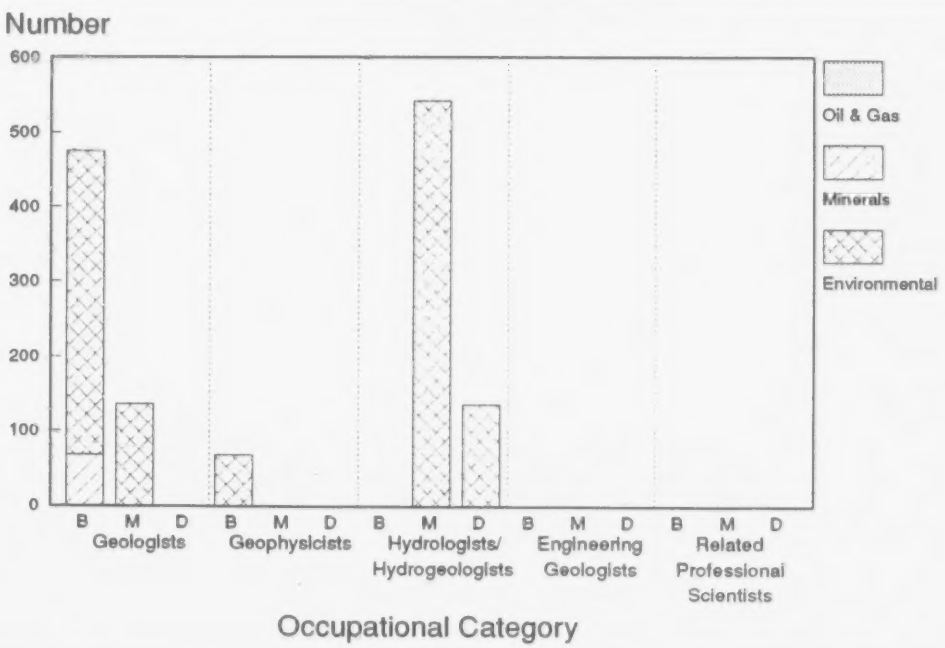
Geoscientific consulting firms provided the number of geoscientists actually hired in 1989, as shown in Table 61 and Figure k:

TABLE 61

**Number of Geoscientists Actually Hired in 1989
by Occupational Objective, Occupational Category, and Degree Level
Geoscientific Consulting Firms**

	Occupational Category																			
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Minerals	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	0	0	68	5.0
Environmental	407	136	0	68	0	0	0	542	136	0	0	0	0	0	0	475	678	136	1,289	95.0
Total	475	136	0	68	0	0	0	542	136	0	0	0	0	0	0	543	678	136	1,357	100.0
			611			68			678			0			0			1,357		

**Figure k
Number of Geoscientists Actually Hired in 1989
by Occupational Objective, Occupational Category, and Degree Level
Geoscientific Consulting Firms**



3. Projected Hiring for 1990

Employers provided the number of expected hires for 1990. Those estimates project the number of new hires (i.e., personnel to be hired directly from colleges/universities) and experienced hires. Table 62 shows projections for new hires, by occupational objective, occupational category, and degree level:

TABLE 62

Projected New (Inexperienced) Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Geoscientific Consulting Firms

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Minerals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Environmental	133	133	0	0	0	0	133	200	0	0	0	0	0	0	0	266	333	0	599	100.0
Total	**133**	**133**	**0**	**0**	**0**	**0**	**133**	**200**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**266**	**333**	**0**	**599**	**100.0**
			266			0			333			0			0			599		

Table 63 shows projected 1990 hiring for experienced personnel:

TABLE 63

Projected Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Geoscientific Consulting Firms

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS				
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Minerals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Environmental	267	267	0	0	0	0	0	667	0	0	0	0	333	0	0	600	934	0	1,534	100.0
Total	**267**	**267**	**0**	**0**	**0**	**0**	**0**	**667**	**0**	**0**	**0**	**0**	**333**	**0**	**0**	**600**	**934**	**0**	**1,534**	**100.0**
			534			0			667			0			333			1,534		

Geoscientific Consulting Firms

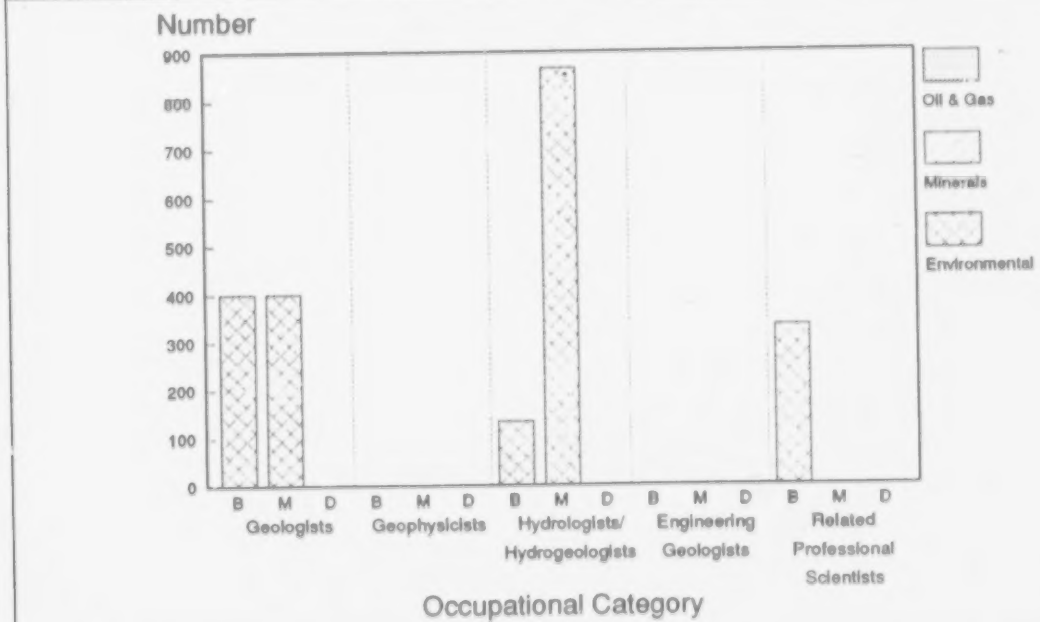
Table 64 and Figure 1 present the total projected hiring (inexperienced and experienced) for 1990 for geoscientific consulting firms:

TABLE 64

Projected New (Inexperienced) and Experienced Hires for 1990
By Occupational Objective, Occupational Category, and Degree Level
Geoscientific Consulting Firms

	Occupational Category																		
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Oil and Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Minerals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Environmental	400	400	0	0	0	0	133	867	0	0	0	0	333	0	0	866	1,267	0	2,133	100.0
Total	400	400	0	0	0	0	133	867	0	0	0	0	333	0	0	866	1,267	0	2,133	100.0
			800			0			1,000			0			333			2,133		

Figure 1
Projected New (Inexperienced) and Experienced Hires for 1990
by Occupational Objective, Occupational Category, and Degree Level
Geoscientific Consulting Firms



4. Projected Losses for 1990

Table 65 presents the number expected to be lost in 1990, due to resignations, retirements, and terminations:

TABLE 65

Projected Losses for 1990
By Occupational Category and Degree Level
Geoscientific Consulting Firms

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS				
Reason for Loss	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Resignations	133	133	0	0	0	0	0	133	0	0	0	0	200	67	0	333	333	0	666	50.0
Retirements	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Terminations	200	133	0	0	0	0	0	133	67	0	0	0	133	0	0	333	266	67	666	50.0
Total	**333**	**266**	**0**	**0**	**0**	**0**	**0**	**266**	**67**	**0**	**0**	**0**	**333**	**67**	**0**	**666**	**599**	**67**	**1,332**	**100.0**
			599			0			333			0			400			1,332		

5. Net Gain/Loss in Employment

The difference between the projected total hiring and the projected total employment loss provides the net gain. Table 66 and Figure m present the net gain/loss for geoscientific consulting firms:

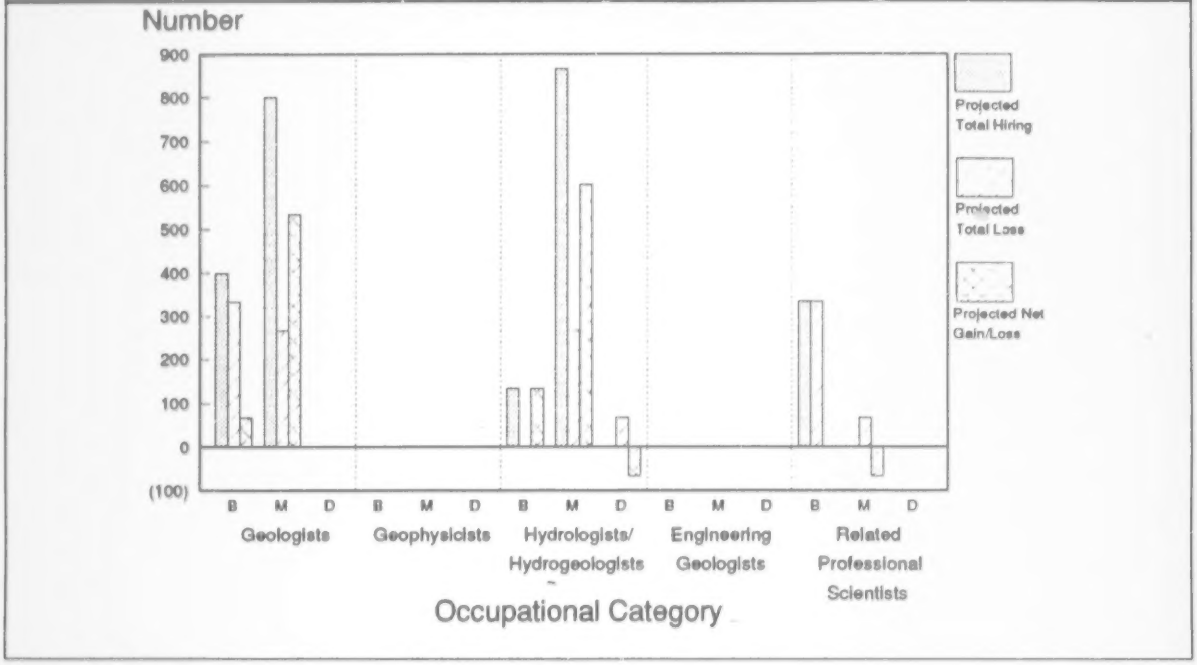
TABLE 66

Projected Net Gain/Loss in Employment
Geoscientific Consulting Firms

Occupational Category

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			TOTALS			
Occupational Objective	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**
Projected Total Hiring	400	800	0	0	0	0	133	867	0	0	0	0	333	0	0	866	1,267	0	2,133
Projected Total Loss	333	266	0	0	0	0	0	266	67	0	0	0	333	67	0	666	599	67	1,332
Projected Net Gain/Loss	**67**	**534**	**0**	**0**	**0**	**0**	**133**	**601**	**-67**	**0**	**0**	**0**	**0**	**-67**	**0**	**200**	**668**	**-67**	**801**

Figure m
Projected Net Gain/Loss in Employment
By Occupational Category and Degree Level
Geoscientific Consulting Firms



6. Approximate Starting Salaries for Inexperienced New Hires

The approximate starting salaries for inexperienced new hires by degree level are as follows:

Degree Level	Approximate Starting Salary
BA/BS	$ 21,250
MA/MS	$ 24,167
PhD	$ 40,000

F. Academia

Appendix, Tables VI.A-F

1. Current Employment Levels

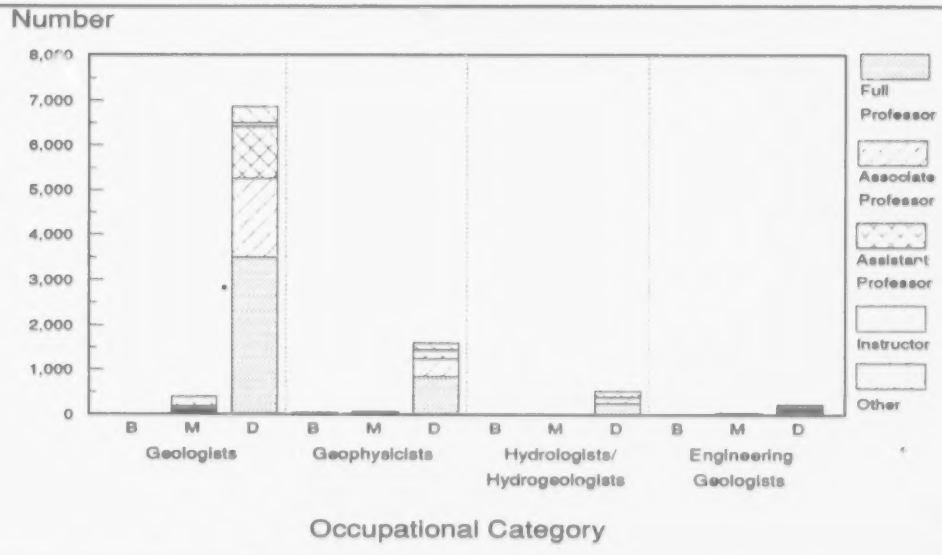
Eighty-three colleges and universities returned employment and hiring information. Table 67 and Figure n present current employment levels (as of 12/31/89) according to occupational level and occupational category, by degree level:

TABLE 67

Current Employment Levels
by Occupational Level, Occupational Category, and Degree Level
Academia

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			TOTALS				
Occupational Level	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Full Professor	0	64	3,500	0	0	855	0	0	245	0	9	100	0	73	4,700	4,773	48.8
Associate Professor	0	36	1,755	0	0	400	0	0	145	0	0	55	0	36	2,355	2,391	24.5
Assistant Professor	0	18	1,173	0	0	200	0	0	155	0	9	55	0	27	1,583	1,610	16.5
Instructor	9	64	73	0	0	9	0	9	0	0	9	0	9	82	82	173	1.8
Other	0	209	364	27	55	136	0	0	0	9	9	18	36	273	518	827	8.5
Total	9	391	6,865	27	55	1,600	0	9	545	9	36	228	45	491	9,238	9,774	100.0
			7,265			1,682			554			273			9,774		

Figure n
Current Employment Levels
by Occupational Objective, Occupational Category and Degree Level
Academia



2. Number Hired in 1989

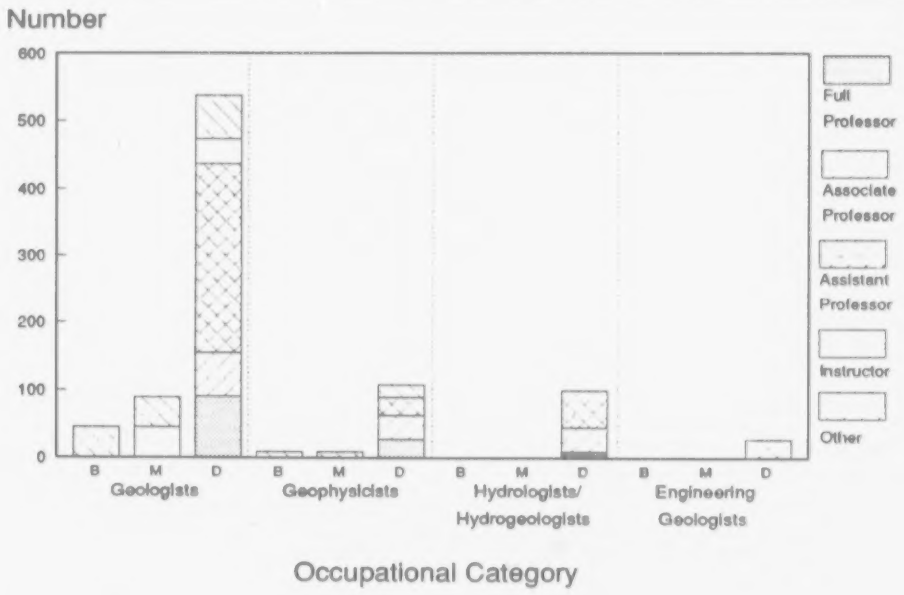
Colleges and universities provided the number of personnel actually hired in 1989, as shown in Table 68 and Figure o:

TABLE 68

Number of Geoscientists Actually Hired in 1989 by Occupational Level, Occupational Category, and Degree Level Academia

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			TOTALS				
Occupational Level	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Full Professor	0	0	91	0	0	27	0	0	9	0	0	0	0	0	127	127	13.7
Associate Professor	0	0	64	0	0	36	0	0	36	0	0	0	0	0	136	136	14.7
Assistant Professor	0	0	282	0	0	27	0	0	55	0	0	27	0	0	391	391	42.3
Instructor	0	45	36	0	0	0	0	0	0	0	0	0	0	45	36	81	8.8
Other	45	45	64	9	9	18	0	0	0	0	0	0	54	54	82	190	20.5
Total	**45**	**90**	**537**	**9**	**9**	**108**	**0**	**0**	**100**	**0**	**0**	**27**	**54**	**99**	**772**	**925**	**100.0**
			672			**126**			**100**			**27**			**925**		

Figure o
Number of Geoscientists Actually Hired in 1989 by Occupational Objective, Occupational Category, and Degree Level Academia



3. Projected Hiring for 1990

Colleges and universities provided the number of expected hires for 1990. Those estimates project the number of new hires (i.e., personnel to be hired directly from colleges/universities) and experienced hires. Table 69 shows projections for new hires, by occupational level, occupational category, and degree level:

TABLE 69

Projected New (Inexperienced) Hires for 1990
By Occupational Level, Occupational Category, and Degree Level
Academia

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			TOTALS				
Occupational Level	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Full Professor	0	0	18	0	0	0	0	0	0	0	0	0	0	0	18	18	3.7
Associate Professor	0	0	9	0	0	18	0	0	9	0	0	0	0	0	36	36	7.3
Assistant Professor	0	0	264	0	0	73	0	0	36	0	0	9	0	0	382	382	78.0
Instructor	9	9	0	0	0	0	0	0	0	0	0	0	9	9	0	18	3.7
Other	0	9	9	0	9	0	0	0	0	0	9	0	0	27	9	36	7.3
Total	**9**	**18**	**300**	**0**	**9**	**91**	**0**	**0**	**45**	**0**	**9**	**9**	**9**	**36**	**445**	**490**	**100.0**
			327			**100**			**745**			**18**			**490**		

Table 70 shows projected 1990 hiring for experienced personnel:

TABLE 70

Projected Experienced Hires for 1990
By Occupational Level, Occupational Category, and Degree Level
Academia

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			TOTALS				
Occupational Level	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total	% of Total
Full Professor	0	0	18	0	0	36	0	0	18	0	0	0	0	0	72	72	15.0
Associate Professor	0	0	18	0	0	9	0	0	9	0	0	0	0	0	36	36	7.5
Assistant Professor	0	0	91	0	0	27	0	0	27	0	0	0	0	0	145	145	30.2
Instructor	0	9	0	0	0	0	0	0	0	0	0	0	0	9	0	9	1.9
Other	55	73	45	27	9	9	0	0	0	0	0	0	82	82	54	218	45.4
Total	**55**	**82**	**172**	**27**	**9**	**81**	**0**	**0**	**54**	**0**	**0**	**0**	**82**	**91**	**307**	**480**	**100.0**
			309			**117**			**54**			**0**			**480**		

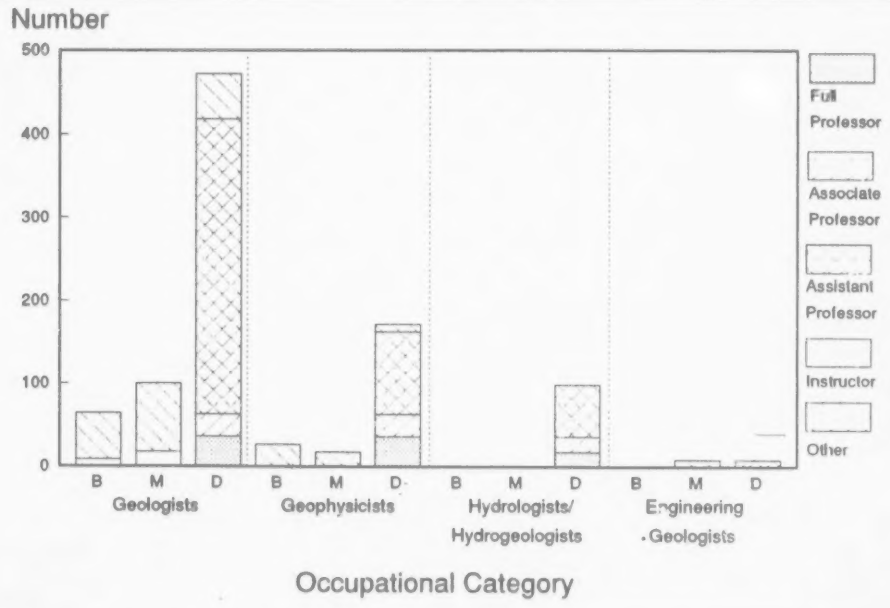
Table 71 and Figure p present the total projected hiring (inexperienced and experienced) for 1990 for academia:

TABLE 71

Projected New (Inexperienced) and Experienced Hires for 1990
By Occupational Level, Occupational Category, and Degree Level
Academia

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			TOTALS				
Occupational Level	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Full Professor	0	0	36	0	0	36	0	0	18	0	0	0	0	0	90	90	9.3
Associate Professor	0	0	27	0	0	27	0	0	18	0	0	0	0	0	72	72	7.4
Assistant Professor	0	0	355	0	0	100	0	0	63	0	0	9	0	0	527	527	54.3
Instructor	9	18	0	0	0	0	0	0	0	0	0	0	9	18	0	27	2.8
Other	55	82	54	27	18	9	0	0	0	0	9	0	82	109	63	254	26.2
Total	**64**	**100**	**472**	**27**	**18**	**172**	**0**	**0**	**99**	**0**	**9**	**9**	**91**	**127**	**752**	**970**	**100.0**
			636			**217**			**99**			**18**			**970**		

Figure p
Projected Total Hires for 1990
by Occupational Objective, Occupational Category, and Degree Level
Academia



4. Projected Losses for 1990

Table 72 presents the number expected to be lost in 1990, due to resignations, retirements, and terminations:

TABLE 72

Projected Losses for 1990
By Occupational Category and Degree Level
Academia

	Occupational Category																
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			TOTALS				
Reason for Loss	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**	**% of Total**
Resignations	45	18	100	18	0	36	0	9	9	0	0	9	63	27	154	244	40.2
Retirements	0	0	164	0	0	9	0	0	18	0	0	0	0	0	191	191	31.5
Terminations	36	27	73	18	9	9	0	0	0	0	0	0	54	36	82	172	28.3
Total	**81**	**45**	**337**	**36**	**9**	**54**	**0**	**9**	**27**	**0**	**0**	**9**	**117**	**63**	**427**	**607**	**100.0**
			463			99			36			9			607		

5. Net Gain/Loss in Employment

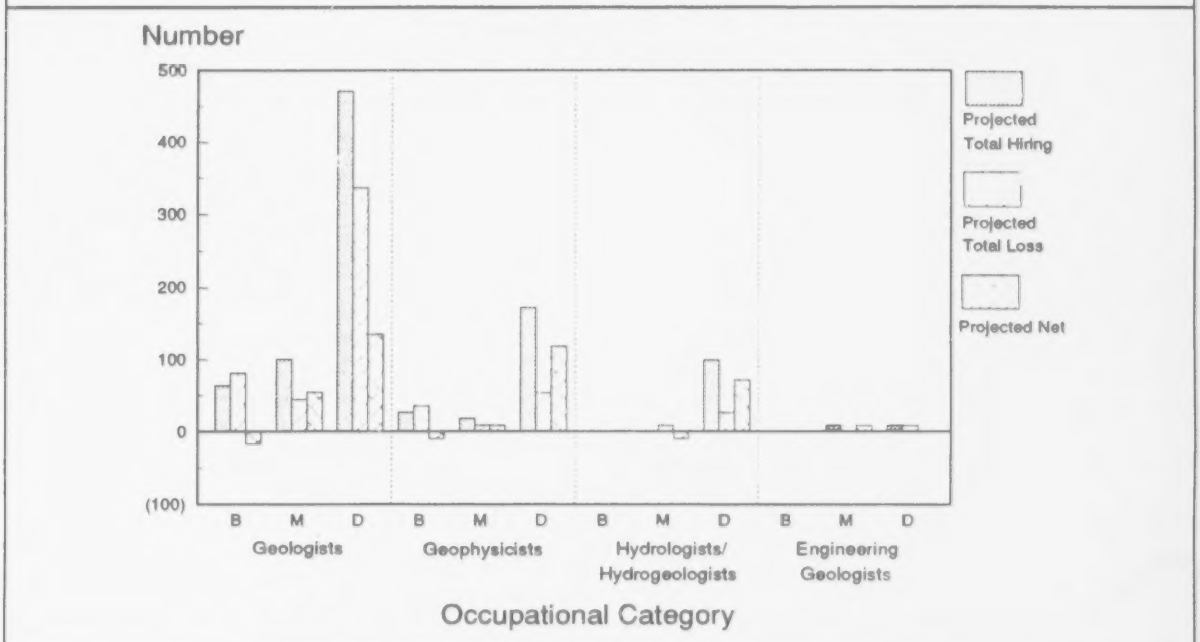
The difference between the projected total hiring and the projected total employment loss provides the net gain. Table 73 and Figure q present the net gain/loss for academia:

TABLE 73

Projected Net Gain/Loss in Employment
Academia

	Occupational Category															
	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			TOTALS			
	B	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**B**	**M**	**D**	**Total**
Projected Total Hiring	64	100	472	27	18	172	0	0	99	0	9	9	91	127	752	970
Projected Total Loss	81	45	337	36	9	54	0	9	27	0	0	9	117	63	427	607
Projected Net Gain/Loss	**-17**	**55**	**135**	**-9**	**9**	**118**	**0**	**-9**	**72**	**0**	**9**	**0**	**-26**	**64**	**325**	**363**

Figure q
Projected Net Gain/Loss in Employment
by Occupational Category and Degree Level
Academia



6. Approximate Starting Salaries for Inexperienced New Hires

The approximate starting salaries for inexperienced new hires by degree level are as follows:

Degree Level	Approximate Starting Salary
BA/BS	$ 19,688
MA/MS	$ 22,727
PhD	$ 31,622

IV. Summary of Employment and Hiring Projections

A. Current Employment Levels

Table 74 summarizes the current employment levels by occupational category and employer category:

Table 74

Summary of Current Employment Levels by Occupational Category and Employer Category

Occupational Category	Employer Category: Oil/Gas Industry	Mining/ Minerals Industry	Federal/ State Govts	Research Insts/ DOE-funded Natl Labs	Geoscientific Consulting Firms	Academia	Total	% of Total
Geologists	19,155	5,023	2,619	1,288	3,188	7,265	38,538	54.3
Geophysicists	10,958	0	229	613	204	1,682	13,686	19.3
Hydrologists/Hydrogeologists	0	0	544	230	2,034	554	3,362	4.7
Engineering Geologists	0	162	0	21	272	273	728	1.0
Related Professional Scientists	5,828	813	5,088	666	2,305	0	14,700	20.7
TOTAL	**35,941**	**5,998**	**8,480**	**2,818**	**8,003**	**9,774**	**71,014**	**100.0**

B. Projected Hiring

Table 75 and Figure r present projected hiring levels for 1990 by occupational category and employer category:

Table 75

Summary of Projected Hiring Levels for 1990 by Occupational Category and Employer Category

	Employer Category							
Occupational Category	Oil/Gas Industry	Mining/ Minerals Industry	Federal/ State Govts	Research Insts/ DOE-Funded National Labs	Geoscientific Consulting Firms	Academia	TOTAL	% of Total
Geologists	855	535	159	40	800	636	3,055	45.9
Geophysicists	777	0	2	147	0	217	1,143	17.3
Hydrologists/ Hydrogeologists	0	0	37	314	1,000	99	1,450	21.8
Engineering Geologists	0	23	0	42	0	18	83	1.5
Related Professional Scientists	270	140	153	3	333	0	899	13.5
TOTAL	(1,932)	(698)	(351)	(546)	(2,133)	(970)	(6,630)	(100.0)
	1,950	**700**	**350**	**550**	**2,150**	**950**	**6,650**	
% Increase over Current Employment	**5.4**	**11.7**	**4.1**	**19.6**	**26.9**	**9.7**	**9.4**	
% of Total Hiring	**29.3**	**10.5**	**5.3**	**8.3**	**32.3**	**14.3**	**100.0**	

Figure r
Summary of Projected Hiring Levels for 1990 by Occupational Category and Employer Category

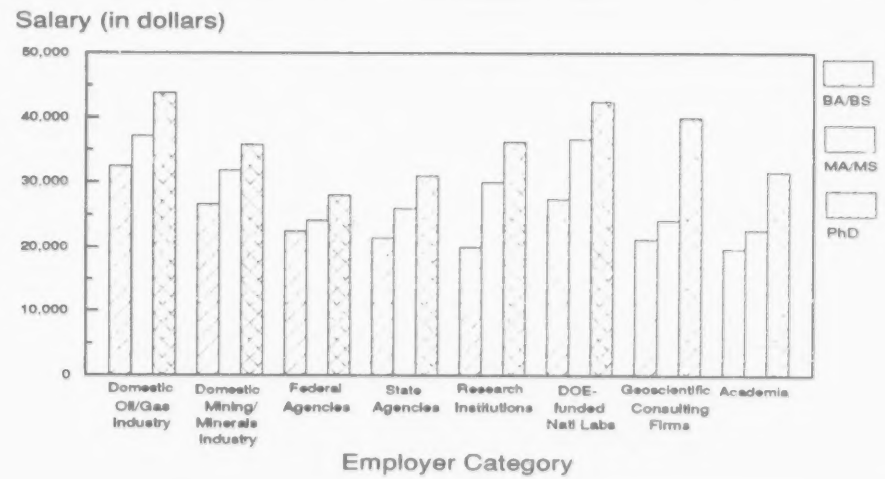
V. Summary of Starting Salaries

Table 76

Approximate Starting Salaries for Inexperienced New Hires by Employer Category and Degree Level

Employer Category	BA/BS	MA/MS	PhD
Domestic Oil and Gas Industry	$32,500	$37,250	$43,750
Domestic Mining and Minerals Industry	$26,667	$31,875	$35,833
Federal/State Government Agencies			
Federal Agency	$22,500	$24,167	$28,125
State Agency	$21,500	$26,029	$31,042
Research Institutions/ DOE-funded National Laboratories			
Research Institutions	$20,000	$30,000	$36,250
DOE-funded National Laboratories	$27,500	$36,667	$42,500
Geoscientific Consulting Firms	$21,250	$24,167	$40,000
Academia	$19,688	$22,727	$31,622

Figure 8
Approximate Starting Salaries for Inexperienced New Hires by Employer Category and Degree Level



APPENDIX
Current Employment Levels and Hiring Projections for 1990

I. Domestic Oil and Gas Industry

Table I.A

Current Employment Levels
Domestic Oil and Gas Industry
(Sample, as of 12/31/89)

	Geologists[1]			Geophysicists			Related Professional Scientists[2]			
	B	M	D	B	M	D	B	M	D	Total
Exploration	304	1,024	183	322	516	108	185	112	34	2,788
Field Development & Production	205	666	59	72	131	6	94	26	14	1,273
Seismic Acquisition & Processing	15	22	12	95	103	15	85	56	8	411
E & P Research	15	54	111	16	40	104	42	19	43	444
Other	7	3	3	1	4	1	79	18	1	116
Total	**546**	**1,769**	**367**	**506**	**794**	**234**	**485**	**231**	**100**	**5,032**
			2,682			**1,534**			**816**	

Table I.B

Number Actually Hired in 1989
Domestic Oil and Gas Industry
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	Total
Exploration	2	39	7	14	45	1	1	0	0	109
Field Development & Production	0	28	7	2	10	0	13	0	0	60
Seismic Acquisition & Processing	0	4	2	4	12	1	9	1	0	33
E & P Research	0	1	8	0	1	9	0	0	1	20
Other	0	1	0	0	0	0	0	0	0	1
Total	**2**	**73**	**24**	**20**	**68**	**11**	**23**	**1**	**1**	**223**
			99			**99**			**25**	

1 Includes Geochemists.

2 e.g., Computer scientists processing geoscience data, chemists in geochemistry labs, etc.

Table I. C

Number of Inexperienced New Hires for 1990
Domestic Oil and Gas Industry
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	Total
Exploration	0	32	13	7	31	2	0	0	0	85
Field Development & Production	0	25	3	1	4	1	12	2	2	50
Seismic Acquisition & Processing	0	3	2	3	8	5	7	2	0	30
E & P Research	0	0	14	0	1	5	0	0	1	21
Other	0	0	0	0	0	0	7	0	0	7
Total	**0**	**60**	**32**	**11**	**44**	**13**	**26**	**4**	**3**	**193**
			92			**68**			**33**	

Table I.D

Number of Experienced Hires for 1990
Domestic Oil and Gas Industry
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	Total
Exploration	1	17	0	6	19	0	0	0	1	44
Field Development & Production	0	6	0	1	3	0	1	1	0	12
Seismic Acquisition & Processing	0	5	0	0	8	0	0	1	0	14
E & P Research	0	0	2	0	1	3	0	0	0	6
Other	0	1	0	0	0	0	1	0	0	2
Total	**1**	**29**	**2**	**7**	**31**	**3**	**2**	**2**	**1**	**78**
			32			**41**			**5**	

Table I.E

Number of Total Hires for 1990
Domestic Oil and Gas Industry
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	Total
Exploration	1	49	13	13	50	2	0	0	1	129
Field Development & Production	0	31	3	2	7	1	13	3	2	62
Seismic Acquisition & Processing	0	8	2	3	16	5	7	3	0	44
E & P Research	0	0	16	0	2	8	0	0	1	27
Other	0	1	0	0	0	0	8	0	0	9
Total	**1**	**89**	**34**	**18**	**75**	**16**	**28**	**6**	**4**	**271**
			124			**109**			**38**	

Table I.F

Net Gain/Loss in Employment
Domestic Oil and Gas Industry
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	Total
Total Hires	1	89	34	18	75	16	28	6	4	271
Total Loss	27	66	11	10	57	2	18	7	0	198
Net Gain/Loss	**-26**	**23**	**23**	**8**	**18**	**14**	**10**	**-1**	**4**	**73**

II. Domestic Mining/Minerals Industry

Table II.A

Current Employment Levels
Domestic Mining and Minerals Industry
(Sample, as of 12/31/89)

	Geologists			Geochemists			Geophysicists			Engineering Geologists			Other			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Exploration	83	86	16	0	0	0	0	0	0	4	0	1	24	1	1	216
Operations	16	14	0	0	0	0	0	0	0	1	0	1	5	4	0	41
Research	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	**99**	**100**	**16**	**0**	**1**	**0**	**0**	**0**	**0**	**5**	**0**	**2**	**29**	**5**	**1**	**258**
			215			**1**			**0**			**7**			**35**	

Table II.B

Number Actually Hired in 1989
Domestic Mining and Minerals Industry
(Sample, as of 12/31/89)

	Geologists			Geochemists			Geophysicists			Engineering Geologists			Other			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Exploration	4	10	1	0	0	0	0	0	0	0	0	0	0	0	0	15
Operations	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	4
Research	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**6**	**11**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**19**
			18			**0**			**0**			**1**			**0**	

Table II.C

Number of Inexperienced New Hires for 1990
Domestic Mining and Minerals Industry
(Sample, as of 12/31/88)

	Geologists			Geochemists			Geophysicists			Engineering Geologists			Other			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Exploration	1	3	0	0	0	0	0	0	0	0	0	0	3	0	0	7
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Research	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**7**
			4			**0**			**0**			**0**			**3**	

Table II.D

Number of Experienced Hires for 1990
Domestic Mining and Minerals Industry
(Sample, as of 12/31/89)

	Geologists			Geochemists			Geophysicists			Engineering Geologists			Other			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Exploration	4	11	3	0	1	0	0	0	0	0	1	0	3	0	0	23
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Research	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**4**	**11**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**0**	**0**	**23**
			18			**1**			**0**			**1**			**3**	

Table II.E

Number of Total Hires for 1990
Domestic Mining and Minerals Industry
(Sample, as of 12/31/89)

	Geologists			Geochemists			Geophysicists			Engineering Geologists			Other			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Exploration	5	14	3	0	1	0	0	0	0	0	1	0	6	0	0	30
Operations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Research	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**5**	**14**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**6**	**0**	**0**	**30**
			22			**1**			**0**			**1**			**6**	

Table II.F

Net Gain/Loss in Employment
Domestic Mining and Minerals Industry
(Sample, as of 12/31/89)

	Geologists			Geochemists			Geophysicists			Engineering Geologists			Other			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
To Be Hired	5	14	3	0	1	0	0	0	0	0	1	0	6	0	0	30
To Be Lost	3	6	1	0	0	0	0	0	0	0	0	0	24	0	0	34
Net Gain/Loss	**2**	**8**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**-18**	**0**	**0**	**-4**

III. Federal and State Government Agencies - Federal Government Agencies

Table III.A

Current Employment Levels
Federal Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	20	11	5	8	6	9	1	3	0	168	115	172	518
Resource Evaluation	68	41	3	0	0	0	21	9	0	22	16	3	183
Regulatory	9	4	5	1	1	2	7	9	0	15	6	5	64
Other	2	4	1	0	0	0	0	0	0	112	70	11	200
Total	**99**	**60**	**14**	**9**	**7**	**11**	**29**	**21**	**0**	**317**	**207**	**191**	**965**
			173			27			50			715	

Table III.B

Number Actually Hired in 1989
Federal Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	1	0	0	0	0	2	0	1	0	5	5	10	24
Resource Evaluation	2	1	0	0	0	0	1	0	0	1	1	0	6
Regulatory	0	0	0	0	0	0	0	2	0	1	0	0	3
Other	0	1	0	0	0	0	0	0	0	5	4	0	10
Total	**3**	**2**	**0**	**0**	**0**	**2**	**1**	**3**	**0**	**12**	**10**	**10**	**43**
			5			2			4			32	

Table III.C

Number of Inexperienced New Hires for 1990
Federal Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	1	1	0	0	0	0	0	0	0	3	2	1	8
Resource Evaluation	1	0	0	0	0	0	1	0	0	0	0	0	2
Regulatory	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	1	2	0	3
Total	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	**4**	**1**	**13**
			3			0			1			9	

Table III.D

Number of Experienced Hires for 1990
Federal Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	1	1	0	0	0	0	0	0	0	1	1	1	5
Resource Evaluation	2	2	0	0	0	0	0	0	0	1	3	1	9
Regulatory	0	0	0	0	0	0	0	0	0	0	1	0	1
Other	0	0	0	0	0	0	0	0	0	1	1	0	2
Total	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**6**	**2**	**17**
			6			**0**			**0**			**11**	

Table III.E

Number of Total Hires for 1990
Federal Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	2	2	0	0	0	0	0	0	0	4	3	2	13
Resource Evaluation	3	2	0	0	0	0	1	0	0	1	3	1	11
Regulatory	0	0	0	0	0	0	0	0	0	0	1	0	1
Other	0	0	0	0	0	0	0	0	0	2	3	0	5
Total	**5**	**4**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**7**	**10**	**3**	**30**
			9			**0**			**1**			**20**	

Table III.F

Net Gain/Loss in Employment
Federal Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
To Be Hired	5	4	0	0	0	0	1	0	0	7	10	3	30
To Be Lost	4	4	0	0	0	0	1	0	0	15	12	6	42
Net Gain/Loss	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-8**	**-2**	**-3**	**-12**

State Government Agencies

Table III.G

Current Employment Levels
State Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	96	184	132	1	3	10	6	31	13	15	10	23	524
Resource Evaluation	43	85	30	1	4	1	23	24	4	24	21	1	261
Regulatory	40	27	5	0	0	0	0	1	0	9	1	2	85
Other	32	42	20	2	0	2	1	2	0	16	17	5	139
Total	**211**	**338**	**187**	**4**	**7**	**13**	**30**	**58**	**17**	**64**	**49**	**31**	**1,009**
			736			**24**			**105**			**144**	

Table III.H

Number Actually Hired in 1989
State Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	17	19	7	0	0	3	2	3	3	3	0	1	58
Resource Evaluation	2	6	0	0	0	0	4	5	0	3	3	0	23
Regulatory	4	2	0	0	0	0	0	0	0	1	0	0	7
Other	4	3	0	0	0	0	0	0	0	1	0	3	11
Total	**27**	**30**	**7**	**0**	**0**	**3**	**6**	**8**	**3**	**8**	**3**	**4**	**99**
			64			**3**			**17**			**15**	

Table III.I

Number of Inexperienced New Hires for 1990
State Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	5	12	0	0	0	0	0	1	0	2	1	1	22
Resource Evaluation	0	4	1	0	0	0	3	5	0	0	0	0	13
Regulatory	2	0	0	0	0	0	0	0	0	0	0	0	2
Other	1	0	0	0	0	0	0	0	0	1	0	0	2
Total	**8**	**16**	**1**	**0**	**0**	**0**	**3**	**6**	**0**	**3**	**1**	**1**	**39**
			25			**0**			**9**			**5**	

Table III.J

Number of Experienced Hires for 1990
State Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	5	8	2	0	1	0	1	5	0	2	2	0	26
Resource Evaluation	0	2	1	0	0	0	0	0	0	0	0	0	3
Regulatory	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	2	3	1	0	0	0	0	0	0	1	2	0	9
Total	**7**	**13**	**4**	**0**	**1**	**0**	**1**	**5**	**0**	**3**	**4**	**0**	**38**
			24			**1**			**6**			**7**	

Table III.K

Number of Total Hires for 1990
State Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	10	20	2	0	1	0	1	6	0	4	3	1	48
Resource Evaluation	0	6	2	0	0	0	3	5	0	0	0	0	16
Regulatory	2	0	0	0	0	0	0	0	0	0	0	0	2
Other	3	3	1	0	0	0	0	0	1	2	2	0	12
Total	**15**	**29**	**5**	**0**	**1**	**0**	**4**	**11**	**1**	**6**	**5**	**1**	**78**
			49			**1**			**16**			**12**	

Table III.L

Net Gain/Loss in Employment
State Government Agencies
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
To Be Hired	15	29	5	0	1	0	4	11	1	6	5	1	78
To Be Lost	9	10	4	0	2	0	1	5	0	1	1	3	36
Net Gain/Loss	**6**	**19**	**1**	**0**	**-1**	**0**	**3**	**6**	**1**	**5**	**4**	**-2**	**42**

IV. Research Institutions and DOE-funded National Laboratories - Research Institutions

Table IV.A

Current Employment Levels
Research Institutions
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	10	5	53	46	1	31	0	0	0	0	0	0	0	0	9	155
Applied	2	0	0	0	0	0	0	0	0	0	0	0	6	3	0	11
Other	6	3	2	0	0	0	0	0	0	0	0	0	4	0	0	15
Total	18	8	55	46	1	31	0	0	0	0	0	0	10	3	9	181
			81			78			0			0			22	

Table IV.B

Number Actually Hired in 1989
Research Institutions
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	1	1	3	10	0	11	0	0	0	0	0	0	0	0	1	27
Applied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	1	4	10	0	11	0	0	0	0	0	0	0	0	1	28
			6			21			0			0			1	

Table IV.C

Number of Inexperienced New Hires for 1990
Research Institutions
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	3	0	3	10	0	5	0	0	0	0	0	0	0	0	0	21
Applied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3**	**0**	**3**	**10**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**21**
			6			**15**			**0**			**0**			**0**	

Table IV.D

Number of Experienced New Hires for 1990
Research Institutions
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
Applied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**
			1			**0**			**0**			**0**			**1**	

Table IV.E

Number of Total Hires for 1990
Research Institutions
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	3	0	4	10	0	5	0	0	0	0	0	0	0	0	1	23
Applied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**3**	**0**	**4**	**10**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**23**
			7			**15**			**0**			**0**			**1**	

Table IV.F

Net Gain/Loss in Employment
Research Institutions
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
To be Hired	3	0	4	10	0	5	0	0	0	0	0	0	0	0	1	23
To be Lost	2	0	3	3	0	3	0	0	0	0	0	0	0	0	1	12
Net Gain/Loss	**1**	**0**	**1**	**7**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**

Research Institutions and DOE-funded National Laboratories -

DOE-funded National Laboratories

Table IV.G

Current Employment Levels
DOE-funded National Laboratories
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	5	9	22	0	2	11	1	1	4	0	1	0	0	2	5	63
Applied	3	6	6	1	3	2	1	2	2	0	0	0	7	12	3	48
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	8	15	28	1	5	13	2	3	6	0	1	0	7	14	8	111
			51			19			11			1			29	

Table IV.H

Number Actually Hired in 1989
DOE-funded National Laboratories
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	0	1	3	0	0	0	0	0	0	0	0	1	0	0	1	6
Applied	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	3	0	0	1	0	0	0	0	0	1	0	0	1	7
			4			1			0			1			1	

Table IV.I

Number of Inexperienced New Hires for 1990
DOE-funded National Laboratories
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	3
Applied	0	0	0	0	1	0	0	2	1	0	0	0	0	0	0	4
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	2	3	0	0	1	0	0	0	7
			0			1			5			1			0	

Table IV.J

Number of Experienced Hires for 1990
DOE-funded National Laboratories
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	0	0	0	0	0	3	0	1	3	0	0	0	0	0	0	7
Applied	0	0	1	0	1	0	0	1	5	0	0	1	0	0	0	9
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**1**	**0**	**1**	**3**	**0**	**2**	**8**	**0**	**0**	**1**	**0**	**0**	**0**	**16**
			1			4			10			1			0	

Table IV.K

Number of Total Hires for 1990
DOE-funded National Laboratories
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Research	0	0	0	0	0	3	0	1	5	0	0	1	0	0	0	9
Applied	0	0	1	0	2	0	0	3	6	0	0	1	0	0	0	13
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**1**	**0**	**2**	**3**	**0**	**4**	**11**	**0**	**0**	**2**	**0**	**0**	**0**	**23**
			1			5			15			2			0	

Table IV.L

Net Gain/Loss in Employment
DOE-funded National Laboratories
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
To be Hired	0	0	1	0	2	3	0	4	11	0	0	2	0	0	0	23
To be Lost	0	1	1	0	1	1	0	0	1	0	0	0	0	0	3	8
Net Gain/Loss	0	-1	0	0	1	2	0	4	10	0	0	2	0	0	-3	15

V. Geoscientific Consulting Firms

Table V.A

Current Employment Levels
Geoscientific Consulting Firms
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Oil & Gas	2	3	0	0	0	1	0	0	0	0	0	0	0	0	0	6
Minerals	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
Environmental	16	22	2	0	1	0	4	22	4	2	1	1	24	6	4	109
Total	**20**	**25**	**2**	**0**	**2**	**1**	**4**	**22**	**4**	**2**	**1**	**1**	**24**	**6**	**4**	**118**
			47			3			30			4			34	

Table V.B

Number Actually Hired in 1989
Geoscientific Consulting Firms
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Oil & Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minerals	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Environmental	6	2	0	1	0	0	0	8	2	0	0	0	0	0	0	19
Total	**7**	**2**	**0**	**1**	**0**	**0**	**0**	**8**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**20**
			9			1			10			0			0	

Table V.C

Number of Inexperienced Hires for 1990
Geoscientific Consulting Firms
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Other Related Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Oil & Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minerals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental	2	2	0	0	0	0	2	3	0	0	0	0	0	0	0	9
Total	**2**	**2**	**0**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**
			4			0			5			0			0	

Table V.D

Number of Experienced Hires for 1990
Geoscientific Consulting Firms
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Oil & Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minerals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental	4	4	0	0	0	0	0	10	0	0	0	0	5	0	0	23
Total	**4**	**4**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**23**
			8			**0**			**10**			**0**			**5**	

Table V.E

Number of Total Hires for 1990
Geoscientific Consulting Firms
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Oil & Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minerals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental	6	6	0	0	0	0	2	13	0	0	0	0	5	0	0	32
Total	**6**	**6**	**0**	**0**	**0**	**0**	**2**	**13**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**32**
			12			**0**			**15**			**0**			**5**	

Table V.F

Net Gain/Loss in Employment
Geoscientific Consulting Firms
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			Related Professional Scientists			
	B	M	D	B	M	D	B	M	D	B	M	D	B	M	D	Total
Total Hires	6	6	0	0	0	0	2	13	0	0	0	0	5	0	0	32
Total Loss	5	4	0	0	0	0	0	4	1	0	0	0	5	1	0	20
Net Gain/Loss	**1**	**2**	**0**	**0**	**0**	**0**	**2**	**9**	**-1**	**0**	**0**	**0**	**0**	**-1**	**0**	**12**

VI. Domestic Academic Institutions

Table VI.A

Current Employment Levels
Academia
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Full Professor	0	7	385	0	0	94	0	0	27	0	1	11	525
Associate Professor	0	4	193	0	0	44	0	0	16	0	0	6	263
Assistant Professor	0	2	129	0	0	22	0	0	17	0	1	6	177
Instructor	1	7	8	0	0	1	0	1	0	0	1	0	19
Other	0	23	40	3	6	15	0	0	0	1	1	2	91
Total	**1**	**43**	**755**	**3**	**6**	**176**	**0**	**1**	**60**	**1**	**4**	**25**	**1,075**
			799			**185**			**61**			**30**	

Table VI.B

Number Actually Hired in 1989
Academia
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Full Professor	0	0	10	0	0	3	0	0	1	0	0	0	14
Associate Professor	0	0	7	0	0	4	0	0	4	0	0	0	15
Assistant Professor	0	0	31	0	0	3	0	0	6	0	0	3	43
Instructor	0	5	4	0	0	0	0	0	0	0	0	0	9
Other	5	5	7	1	1	2	0	0	0	0	0	0	21
Total	**5**	**10**	**59**	**1**	**1**	**12**	**0**	**0**	**11**	**0**	**0**	**3**	**102**
			74			**14**			**11**			**3**	

Table VI.C

Number of Inexperienced New Hires for 1990
Academia
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Full Professor	0	0	2	0	0	0	0	0	0	0	0	0	2
Associate Professor	0	0	1	0	0	2	0	0	1	0	0	0	4
Assistant Professor	0	0	29	0	0	8	0	0	4	0	0	1	42
Instructor	1	1	0	0	0	0	0	0	0	0	0	0	2
Other	0	1	1	0	1	0	0	0	0	0	1	0	4
Total	**1**	**2**	**33**	**0**	**1**	**10**	**0**	**0**	**5**	**0**	**1**	**1**	**54**
			36			**11**			**5**			**2**	

Table VI.D

Number of Experienced Hires for 1990
Academia
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Full Professor	0	0	2	0	0	4	0	0	2	0	0	0	8
Associate Professor	0	0	2	0	0	1	0	0	1	0	0	0	4
Assistant Professor	0	0	10	0	0	3	0	0	3	0	0	0	16
Instructor	0	1	0	0	0	0	0	0	0	0	0	0	1
Other	6	8	5	3	1	1	0	0	0	0	0	0	24
Total	**6**	**9**	**19**	**3**	**1**	**9**	**0**	**0**	**6**	**0**	**0**	**0**	**53**
			34			**13**			**6**			**0**	

Table VI.E

Number of Total Hires for 1990
Academia
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
Full Professor	0	0	4	0	0	4	0	0	2	0	0	0	10
Associate Professor	0	0	3	0	0	3	0	0	2	0	0	0	8
Assistant Professor	0	0	39	0	0	11	0	0	7	0	0	1	58
Instructor	1	2	0	0	0	0	0	0	0	0	0	0	3
Other	6	9	6	3	2	1	0	0	0	0	1	0	28
Total	**7**	**11**	**52**	**3**	**2**	**19**	**0**	**0**	**11**	**0**	**1**	**1**	**107**
			70			**24**			**11**			**2**	

Table VI.F

Net Gain/Loss in Employment
Academia
(Sample, as of 12/31/89)

	Geologists			Geophysicists			Hydrologists/ Hydrogeologists			Engineering Geologists			
	B	M	D	B	M	D	B	M	D	B	M	D	Total
To Be Hired	7	11	52	3	2	19	0	0	11	0	1	1	107
To Be Lost	9	5	37	4	1	6	0	1	3	0	0	1	67
Net Gain/Loss	**-2**	**6**	**15**	**-1**	**1**	**13**	**0**	**-1**	**8**	**0**	**1**	**0**	**40**

Table VII.A

Summary of Current Employment Levels and Hiring Projections for 1990

	Domestic Oil & Gas Industry	Domestic Mining & Minerals Industry	Federal & State Government Agencies	Research Institutions & DOE-funded Nat'l Labs	Geoscientific Consulting Firms	Academia	TOTAL
Number Employed	5,032	258	1,974	292	118	1,075	8,749
Number in Geoscience Population	36,000	6,000	8,500	2,800	8,000	9,800	71,100
% of Population Reported	14.0	4.3	23.2	10.4	1.5	11.0	12.3
Campus Hiring	1,377	163	F 88	R 58	599	490	3,000
			S 78	D 147			
			166	205			
Experienced Hiring	555	535	F 109	R 6	1,534	480	3,630
			S 76	D 335			
			185	341			
Total Projected Hiring	1,932	698	351	546	2,133	970	6,630
% of Total Hiring	29.1	10.5	10.8	8.2	32.2	14.6	99.9
% Increase over Current Levels	5.4	11.6	5.3	19.5	26.6	9.9	9.3
Number to be Lost	1,415	789	F 280	R 34	1,332	607	4,697
			S 72	D 168			
			352	202			
Net Gain	517	-91	-1	344	801	363	1,933
% of Total Gain	26.8	-4.7	0.0	17.8	41.4	18.8	100.0
% Increase over Current Levels	1.4	-1.5	0.0	12.3	10.0	3.7	2.7

F = Federal Government Agencies
S = State Government Agencies
R = Research Institutions
D = DOE-funded National Laboratories

American Geological Institute
4220 King Street
Alexandria, Virginia 22302
(703) 379-2480

ISBN 0-922152-08-X